No. 7

Growth and change: perspectives of education in Asia

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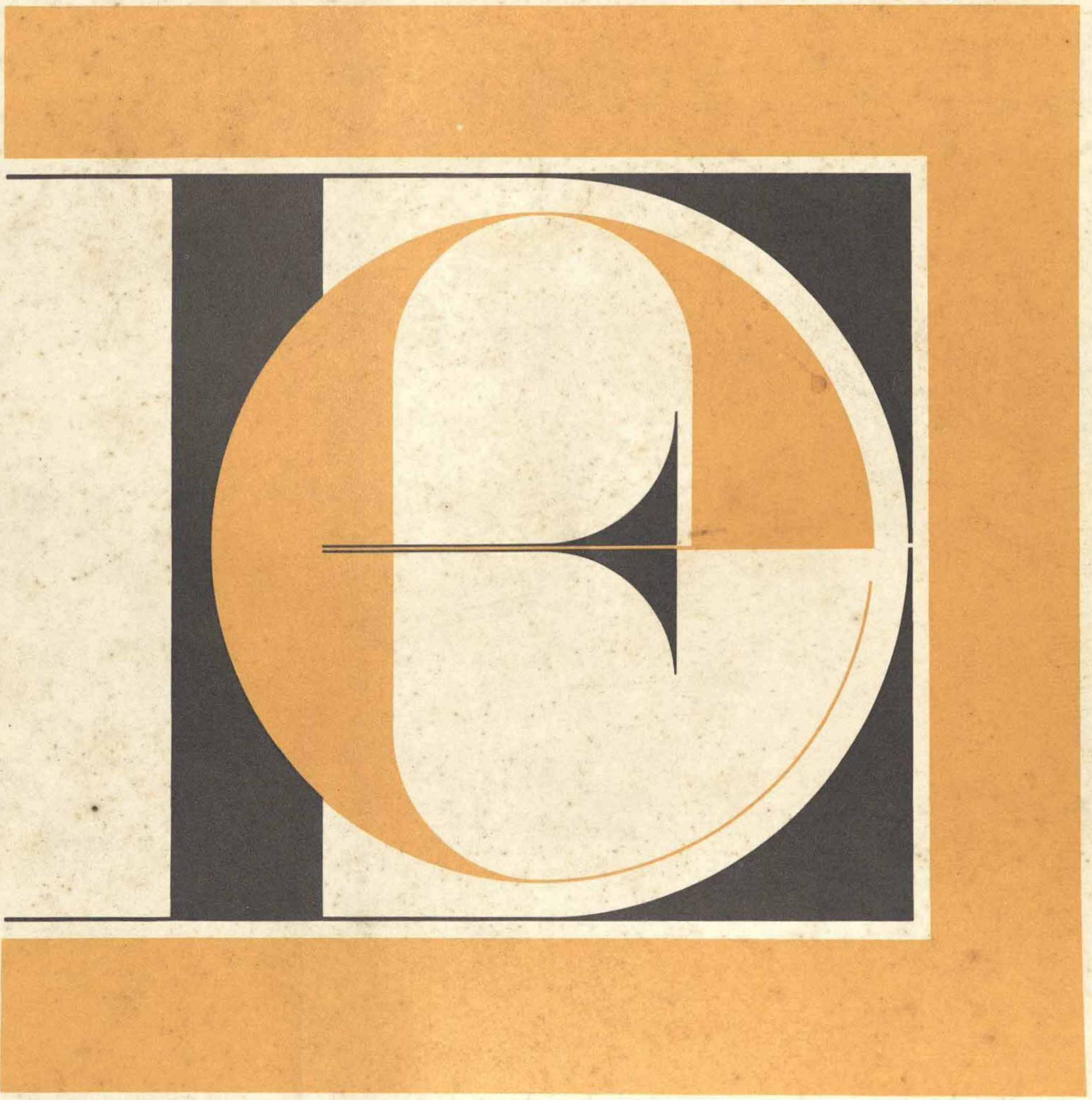

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Growth and change: perspectives of education in Asia

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PREFACE

STATE INSTITUTE of EDUCATION
Govt. of West Bengal

The present publication arises from the Third Regional Conference of Ministers of Education and Those Responsible for Economic Planning in Asia, convened by Unesco in co-operation with the United Nations Economic Commission for Asia and the Far East, at Singapore from 31 May to 7 June 1971.

Meeting at the beginning of the Second Development Decade, the Conference reviewed the progress of education in the preceding decade and studied the perspectives of future development. It saw earlier development as giving way to a new phase which will be dominated by the need to reform and reorient education in order to respond to the quickening pace of change.

The Conference adopted a resolution asking Unesco to publish the documentation of the Conference for wider circulation, and the present publication is the outcome of that request. It draws its material from the debates and the working papers presented to the Conference.

Following the earlier Regional Conferences which prepared the Karachi Plan for free and compulsory primary education in Asia (Karachi, 1959-1960), and the Asian Model of Educational Development (Bangkok, 1965), the Third Regional Conference at Singapore mainly considered problems of education in the developing countries of Asia which are participating in the Karachi Plan. Hence, the terms "Asian region", "countries of the region" and "region" refer to the Member States which, at the time when the Conference was held, were participating in the Karachi Plan and the Asian Model.(1) For the same reason, statistical data presented to the Conference have been retained without any attempt to cover the years after 1968, so long as the conclusions drawn from the data remain valid in the light of subsequent information.

The designations employed, like the presentation of the material, do not imply the expression of any opinion whatsoever on the part of the Unesco Secretariat concerning the legal status of any country or territory, or of its authorities, or concerning the delimitations of the frontiers of any country or territory.

The final report of the Third Regional Conference has already appeared. The present publication, reaching out to a wider circle of interested readers, will, it is hoped, help to convey the concerns of education policy-makers in Asia and the programmes and priorities that they envisage for the growth and development of education in the region.

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(1) Afghanistan, Burma, Republic of China, India, Indonesia, Iran, Republic of Korea, Khmer Republic, Laos, Malaysia, Mongolia, Nepal, Pakistan, Philippines, Singapore, Sri Lanka, Thailand, and Republic of Viet-Nam.

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INTRODUCTION

PERSPECTIVES OF CHANGE

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1. A survey of education in Asia during the last two or three decades reveals a dynamic and varied pattern of small education systems, limited in their purpose and scope, growing into major national endeavours; of new opportunities being created where few existed before. This accelerated rate of growth, however, has also defined a wide range of problems which the developing countries in the region have in common. In these problems, the expansion and the qualitative transformation of education are intrinsically linked.

2. The evolution of education systems is moulded by a variety of pressures - the economic needs of society, social and cultural aspirations, and forces that have their origin in the education system itself.

3. The social factors influencing and moulding education find expression in the "demand" for education, with an increasing proportion of the population aspiring to access to educational opportunities. The explosion of "educational aspirations" is one of the striking features of the social scene in the developing countries, and indeed all over the world, creating the dominant pressure for educational expansion. These aspirations reflect a complex interplay of many social attitudes, not least of which is the "fluidity" of class relationship being created by economic forces. Not to have access to education is increasingly viewed as a deprivation and the denial of a developmental benefit.

4. The social forces are also evident in the search for broader social objectives - reduction of economic and social inequalities, equitable distribution of development benefits, maximization of employment opportunities, and population control and family planning. It is now being recognized to an increasing extent that the mobilization of a total development effort in the developing countries is seriously hampered by economic and social inequalities. Earlier economic development planning with its concentration on the single criterion of growth in Gross National Product, is giving way to a more comprehensive approach which includes social development objectives. Education in the coming decade will be seen both as an instrument for realizing these broader social objectives and as one of the objectives of development.

5. In regard to so complex a social phenomenon as education, no single purpose or end can provide an exclusive guide to future planning. The economic, social and educational factors are constantly changing and their influence is not the same for different levels or types of education. Educational policy is therefore concerned, in one of its aspects, with the perception of emergent changes, and with re-examining the changing needs to which the educational endeavour should respond. Planning for the decade ahead, while necessarily based on the progress achieved so far and the existing constraints, has also to embody perception of a future which will be dominated by an accelerating pace of change.

6. The level of economic development in the developing countries of Asia is rising and significant structural changes in the economy are under way, with the industrial sector assuming an increasingly dynamic rôle in economic development. These economic changes define new needs for skills and special training. It is the application of science and technology that lies at the core of changes in production methods, and in the decade ahead, therefore, a radical shift in the orientation and balance of the education systems will be needed to make science, science-based technology and vocationally-oriented education the basic components of education. At the same time, the pace and forms of economic development, together with demographic trends, are producing an increasingly explosive situation of educational unemployment and misemployment. Clearly the link between education and manpower requirements needs to be strengthened.

7. Agriculture is, and will continue to be in the coming decade, the most important activity in the developing countries of the region. Until recently, the performance of the agriculture sector tended to be a drag on the overall economic development of many countries. In the last few years, the discovery and use of high-yielding and fast-maturing

varieties of food plants (a dramatic illustration of the application of science) has brightened the prospects of transforming traditional agriculture into a modern and viable economic sector. It has at the same time underlined the urgent need for rural transformation through an integrated set of changes that include all facets of rural economy, employment opportunities and the development of human resources. Education and training have a crucial rôle to play in rural transformation and in raising the quality of life in the rural areas. The priorities for educational development in the next decade therefore have to be related to the need to provide education in rural areas on a scale and of a quality that will contribute to rural transformation.

8. The process of development is associated with certain fundamental and pervasive transformations in motivations, attitudes, habits and modes of thought and work. Education should be seen not as a passive response to social forces but as an instrument for bringing about social change and transformation. This potential rôle of education is of vital importance in the developing countries. It does not, however, rest on the belief that all education, of whatever kind, is exclusively an instrument of social transformation. The purposes of education and its tools and methods have to be refashioned, both qualitatively and quantitatively, to serve the wider ends of social change and transformation.

9. The emphasis on economic and social factors should not be allowed to overshadow another and no less fundamental aim of educational development: the transmission and enrichment of common cultural and moral values. It is in these values that the individual and society find their identity and worth. Education is not only a medium for the transmission of these values from one generation to another; it is also an expression of a continuing revaluation of values in order to make culture a living and growing tradition.

10. Great pressures for changes in the field of education are building up. These changes cannot be viewed piecemeal or in isolation; they are interlinked and their effects are cumulative. The expansion of school enrolments creates the pressure to change the nature and orientation of education; economic and social changes call for new adjustments to be made in the education systems. This may involve redefining the goals, ends and functions of education in the light of these new needs as well as of their psychological impact, particularly on the younger generation. All this suggests that an overall process of reform concerning the structures, content and methods of education will have to be undertaken through a global innovative approach rather than through scattered and partial improvements or revisions, if the internal coherence of education systems - an indispensable condition of their smooth functioning and effectiveness - is to be ensured.

I. BACKGROUND OF CHANGE

Chapter 1

THE ECONOMIC SETTING

1. At the beginning of the 1950s, the level of economic development expressed in per capita GDP was very low in the developing countries of the region. It is estimated that per capita GDP reached U.S. $78 in 1950. At the same time, the corresponding figures for all the developed and developing countries of the world taken as two separate entities were estimated at U.S. $1,065 and 106 respectively. Of all the developing regions, only Africa was at an economic level which could be roughly compared with that of the developing Asian region. However, the developing Asian region occupied a special position in the developing world in respect of both major components of per capita GDP. While its share was a little more than 7 per cent of the total GDP created in both the developed and developing country groups, it represented nearly one half (about 47 per cent) of the GDP produced in the developing regions.(1) The respective population figures were also much higher. The region accounted for some 40 per cent of the world population and almost 63 per cent of the population in the developing regions. Population density (around 60 people per square kilometre) was also the highest of all the developing regions. This reflected not only a fairly high population estimate (667 million) but also a relatively small area (11.2 thousand square kilometres). The region covered approximately 11 per cent of the total area as well as the agricultural area of the world, and 17 per cent of the total area and 19 per cent of the agricultural area in the developing regions. Although the proportion of arable land was more favourable (about 26 per cent of the arable land in the world and 43 per cent of that in the developing regions), the region none the less suffered from a relative shortage of this factor of production in comparison with the rest.

2. In the 1950s, the so-called population explosion occurred. The rate of population growth increased substantially in each developing region as a result of a continued fairly high birth rate combined with a falling death rate. Although population growth was lower in the developing Asian region (about 2.2 per cent) than in other developing regions in the 1950s, it was considerably higher than that of the developed regions taken as a whole (about 1.2 per cent). The combined growth effect of both GDP and population led to a lower average annual rate of growth of per capita GDP in this region (1.8 per cent) than in any other developing regions; it also fell behind the developed regions (2.4 per cent).

3. The regional growth results in the 1950s were very modest indeed. True, the average annual rate of growth of total GDP, namely 4 per cent, was slightly higher than in the developed regions. On the other hand, it lagged markedly behind the average annual rates of growth in the developing regions. The growth trends changed in the next years (1960-1967) during which the developing Asian region recorded a small growth improvement, from 4 per cent to 4.5 per cent.

4. The Asian region represents a fairly heterogeneous whole. Some countries, such as India, Indonesia and Pakistan, occupy great areas and contain the majority of the region's population. Others, such as for instance, Afghanistan, Burma, and Iran, occupy large areas but have much smaller populations. Thailand and the Philippines have considerable populations but relatively small areas. In addition, there are some countries which are small both in terms of area and population. Besides population and area, a number of country groups can be distinguished according to such natural criteria as climate, location, natural resources and so on. Social characteristics are equally important in respect of the environment for economic development.

5. Irrespective of the variety in country conditions, nearly all the developing Asian countries had similar major economic characteristics at the outset of the 1950s. They found themselves in a state of economic underdevelopment. The general economic level, expressed in per capita GDP, was low. In most countries of the region, per capita GDP was estimated to be about U.S. $100 or less.

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(1) Excluding centrally planned economies.

India, Pakistan and Indonesia produced a GDP of U. S. $50-60 in per capita terms. Excluding Malaysia, Ceylon, and probably Iran, which exceeded U. S. $100, hardly any of the countries, including Burma, the Khmer Republic, the Republic of Korea, the Philippines and Thailand, differed significantly from the three largest developing countries in this respect. This fairly uniform general picture has nevertheless changed considerably during the succeeding decade.

6. In this period, economic planning has increasingly come to be used as an instrument of rapid economic development. The growth objective has been the priority consideration in medium-term plans, the major form of planning in Asian countries. Of the two broad groups of factors affecting development performance - those influencing the rate of growth of total GDP and those affecting the rate of population growth - the former have exercised the more powerful effects. Since the combined effects of a number of natural and social factors have varied considerably from country to country and have influenced the growth of GDP more strongly than population growth, the rates of growth of total GDP have been very uneven among the countries.

7. Although progress has been rapid in some countries while in others there have been periods of stagnation, all countries have increased their per capita GDP over the last two decades. Thus, regional growth has not been the result of progress in some countries and setbacks in others. This should be emphasized as demonstrating that the momentum of economic development has started in the region.

8. Since growth has been very uneven, the inequalities in economic levels have widened not only among various developing regions but also among the countries of the developing Asian region. While levels of per capita GDP lower than U. S. $100 were typical of most countries some twenty years ago, the range is now mostly between U. S. $100 and $200. Three countries - Malaysia, the Republic of China and Iran - have exceeded a per capita GDP of U. S. $200 and are moving towards U. S. $300. Singapore is estimated to have a per capita GDP level exceeding U. S. $500. The three largest countries, however, have remained the poorest. With per capita GDP levels of U. S. $100 or less, they have kept the regional average well below that of other developing regions.

9. The low level of economic development in the developing Asian countries at the beginning of the 1950s was interconnected with a distinctive sectorial structure, the main features of which were as follows:

The share of agriculture in GDP, including agriculture proper, forestry, fisheries and hunting, was relatively high, varying from one-third in some countries to nearly three-fifths in others. The contribution of agriculture to GDP was the largest of all the major sectors. In only four countries - Burma, the Republic of China, Malaysia and the Philippines - was the share of services greater than that of agriculture.

The share of industry, comprising mining, manufacturing, construction, electricity, gas and water supply, was relatively low, varying from 7.5 per cent to about 22 per cent and thus forming the smallest sector.

The service sector, including transport and communication, trade, banking, public administration and other services, mostly occupied a medium position except in the four countries mentioned above. Its share ranged from some 27 per cent to almost 50 per cent.

10. The process of growth has been accompanied by several changes in the sectoral structure of GDP during the last decade.

The share of agriculture has declined. In the second half of the 1960s, it varied from about 24 per cent in the Republic of China to some 46 per cent in Pakistan and the Republic of Sri Lanka. The share of industry (manufacturing in particular) has increased. It ranged from a little less than 18 per cent in Pakistan to more than 30 per cent in the Republic of China and Iran (39.5 per cent, including the oil industry). Except for the last two, however, industry remained the smallest sector in developing Asian countries.

The share of services increased in most countries (except Burma and the Republic of Korea). It varied from about one-third in India and Indonesia to nearly 49 per cent in Burma.

PROJECTED GROWTH FOR THE SECOND DEVELOPMENT DECADE

11. As a contribution to the design of a development strategy and target-setting for the Second Development Decade, the Regional Centre for Economic Projections and Programming of ECAFE has prepared studies on projections of feasible growth and trade gap, and sectoral output and employment in the developing Asian region for the 1970s.(1) The projections indicate that fairly high growth rates should be feasible for most of the developing countries of the region during the Second Development Decade. For the Republic of China, Iran, the Republic of Korea, Singapore, and Thailand the growth rate in GDP may be around 7 to 10 per cent; in India, Malaysia, Pakistan, the Philippines and the Republic of Sri Lanka around 5 to 7 per cent; and in

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(1) Feasible Growth and Trade Gap Projections in Developing ECAFE Region, Development Programming Techniques Series No. 7, ECAFE Secretariat, and Sectoral Output and Employment Projections for the Second Development Decade, Development Programming Techniques Series No. 8, ECAFE Secretariat.

Afghanistan, Burma, Indonesia and Nepal,(1) below 5 per cent.

12. The estimates of the rates of growth of GDP for the fourteen countries are presented in Table 1. The weighted average annual rate of growth for these countries, which account for more than 95 per cent of the GDP of the developing countries of the ECAFE region, is 6-7 per cent per annum. Thus, these projections imply that an average annual expansion of 3.5 - 4.5 per cent in the per capita Gross Domestic Product of the developing Asian region should be feasible during the next decade, assuming a 2.5 per cent average annual increase of population throughout the period. In other words, the per capita GDP, which was estimated to be U.S. $107 in 1967, is expected to reach U.S. $174 in 1980.

13. However, the projections of the feasible growth rates imply that, in order to achieve the accelerated pace of development in the 1970s, the developing countries will have to make vigorous efforts to raise their savings and investment levels. They will have to adopt appropriate measures, such as modification of existing rates of taxes, imposition of new taxes, more efficient taxation, improvement in the managerial efficiency of public enterprises, mobilization of private savings through various financial institutions (including insurance) etc., for expanding and canalizing both public and private components of domestic savings.

14. The feasible growth and trade gap projections also bring out clearly that the major bottleneck for most of the developing countries in achieving an accelerated pace of development in the 1970s is essentially the trade gap which is generally found to be dominant over the domestic resource gap. The implications are that export proceeds and the transfer of foreign resources will remain crucial for accelerated growth on the part of the

Table 1

Growth Rates of Gross Domestic Product (GDP) 1970/1980
(per cent per annum)

Country	Growth rate of GDP	
	Low projections	High projections
Afghanistan	3.5(a)	4.7(a)
Burma	4.0	5.0
China, Republic of	7.0	8.5(b)
India	5.5	6.5
Indonesia	4.0	5.0
Iran	8.0	10.0(b)
Korea, Republic of	8.0	10.0(b)
Malaysia	6.5	6.5
Nepal	2.2(a)	3.7(a)
Pakistan	6.0	7.0
Philippines	6.0(b)	7.0(b)
Singapore	7.0(a)	7.0(a)
Sri Lanka, Republic of	4.5	5.5
Thailand	8.0(b)	8.5(b)
Region	6.0	7.0

Source: Feasible Growth and Trade Gap Projections in Developing ECAFE Region, Programming Techniques Series No. 7, ECAFE Secretariat.

(a) PAB estimates.

(b) Revised estimates, see Sectoral Output and Employment Projections for the Second Development Decade, Programming Techniques Series No. 8, ECAFE Secretariat.

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(1) Feasible rates of growth of GDP during the 1970s for Afghanistan, Nepal and Singapore are the estimates of the Planning Advisory Bureau (PAB), Food and Agriculture Organization (FAO).

developing countries. Equally important is that the developed countries achieve a flow of aid to developing countries at the rate of one per cent of their Gross National Product from the commencement of the Second Development Decade.

SECTORAL GROWTH

(a) Agriculture

15. Agriculture is by far the most important activity in the developing countries of the region, and hence its contribution will be important in achieving an accelerated pace of development. The estimates of long-term prospects for agriculture suggest that agricultural output (including fisheries and forestry) can be increased by around 4 per cent per year. An average annual expansion of 6-7 per cent in the total Gross Domestic Product, it should be noted, implies an annual increase in the demand for agricultural goods (including fisheries and forestry) of around 4 per cent.

16. The new agricultural technology, which has brightened future prospects for the agricultural sector, will necessitate a review of policies relating to income distribution and agrarian structure, and demand an increased supply of fertilizers and a marked improvement in irrigation and water management. Hitherto, the new technological breakthrough has mainly benefited the big farmers. Thus, adoption of appropriate policy measures within the framework of national development plans, such as substantial expansion of bank credits, research and other types of facilities, is essential to enable small farmers to utilize the new technology. On the other hand, new post-harvest problems are emerging particularly in respect of storage, processing, transport and marketing and unless they are solved in good time, the favourable effects of increased production will be limited.

(b) Industry

17. It is recognized that agricultural and industrial activities are complementary and support each other in the development process. However, it is the growing momentum and dynamism of the non-agricultural activities, industry in particular, that will help to boost the overall average annual rate of growth to the target levels and also help to modernize the backward sectors of the developing countries.

The sectoral output projections prepared by ECAFE's Regional Centre for Economic Projections and Programming[1] indicate that in order to achieve an average annual rate of growth of 6-7 per cent, the Asian developing countries as a whole will have to increase their manufacturing output at an average annual rate of 9-10 per cent during the next decade. Construction and mining sectors are projected to expand by an average of 7-9 and 7-8 per cent per year, respectively.

(c) Services

18. According to ECAFE Secretariat projections, the demand for services including transport, communication and trade will grow at an average annual rate of 7-8 per cent per annum.

Although, for accelerated development, expansion in such activities as transport, communication and trade is essential, it is considered that education and standards of health require serious attention in the developing countries of Asia. It is now accepted that education is a powerful instrument of economic growth and that the education systems, particularly in developing countries, should be attuned to serving development needs.

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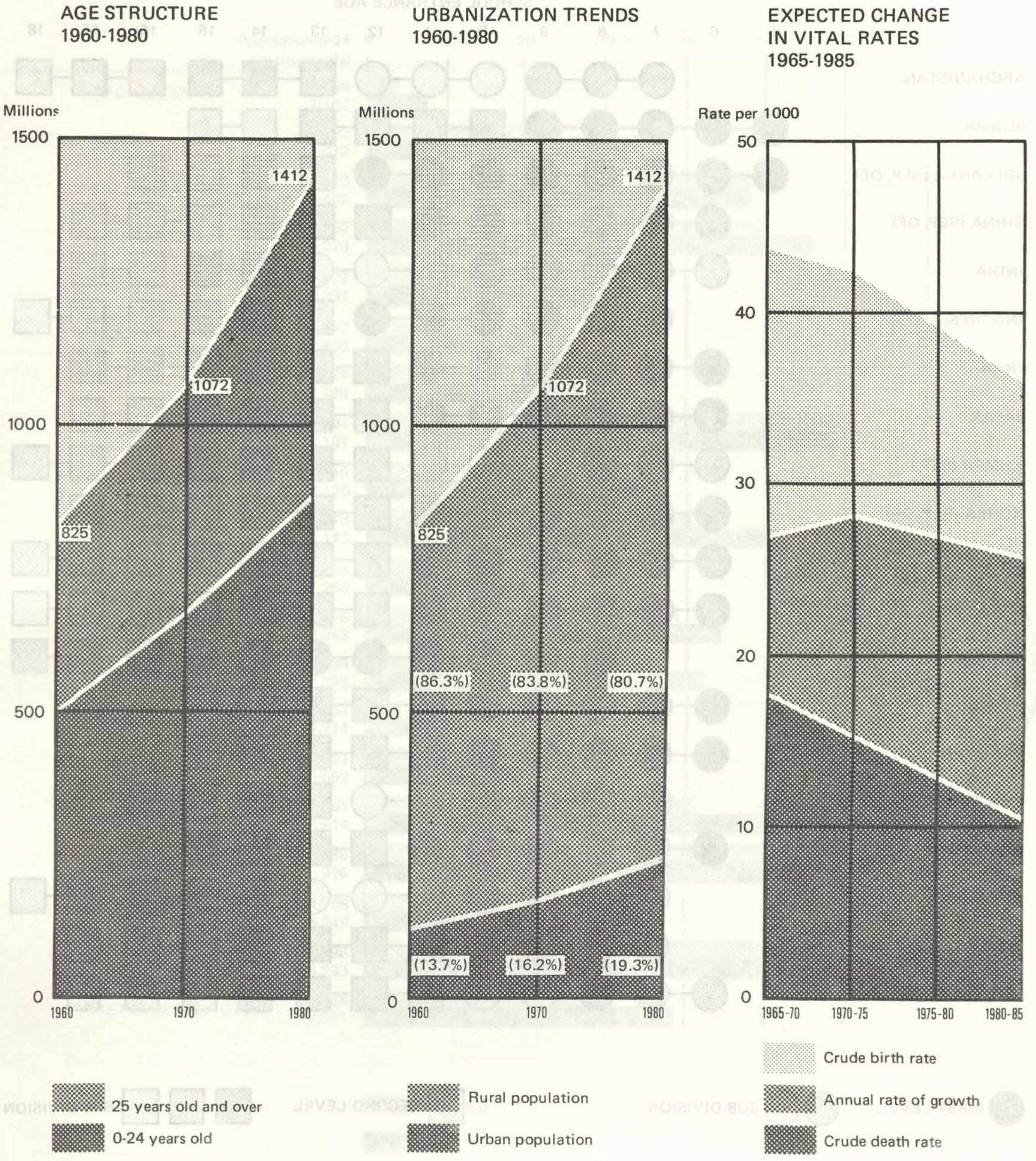
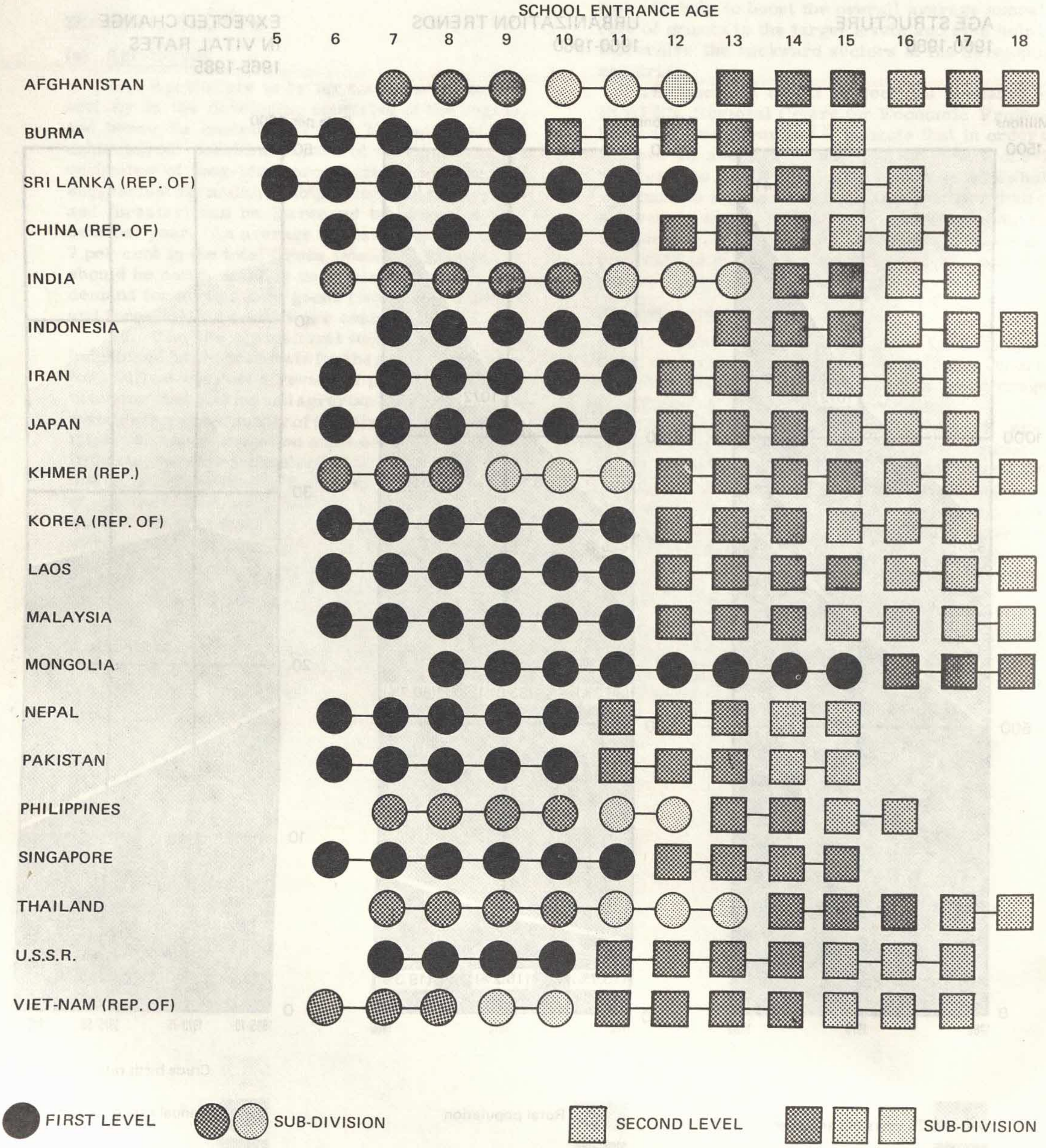
(1) Sectoral Output and Employment Projections for the Second Development Decade, Development Programming Techniques Series No. 8, ECAFE Secretariat.

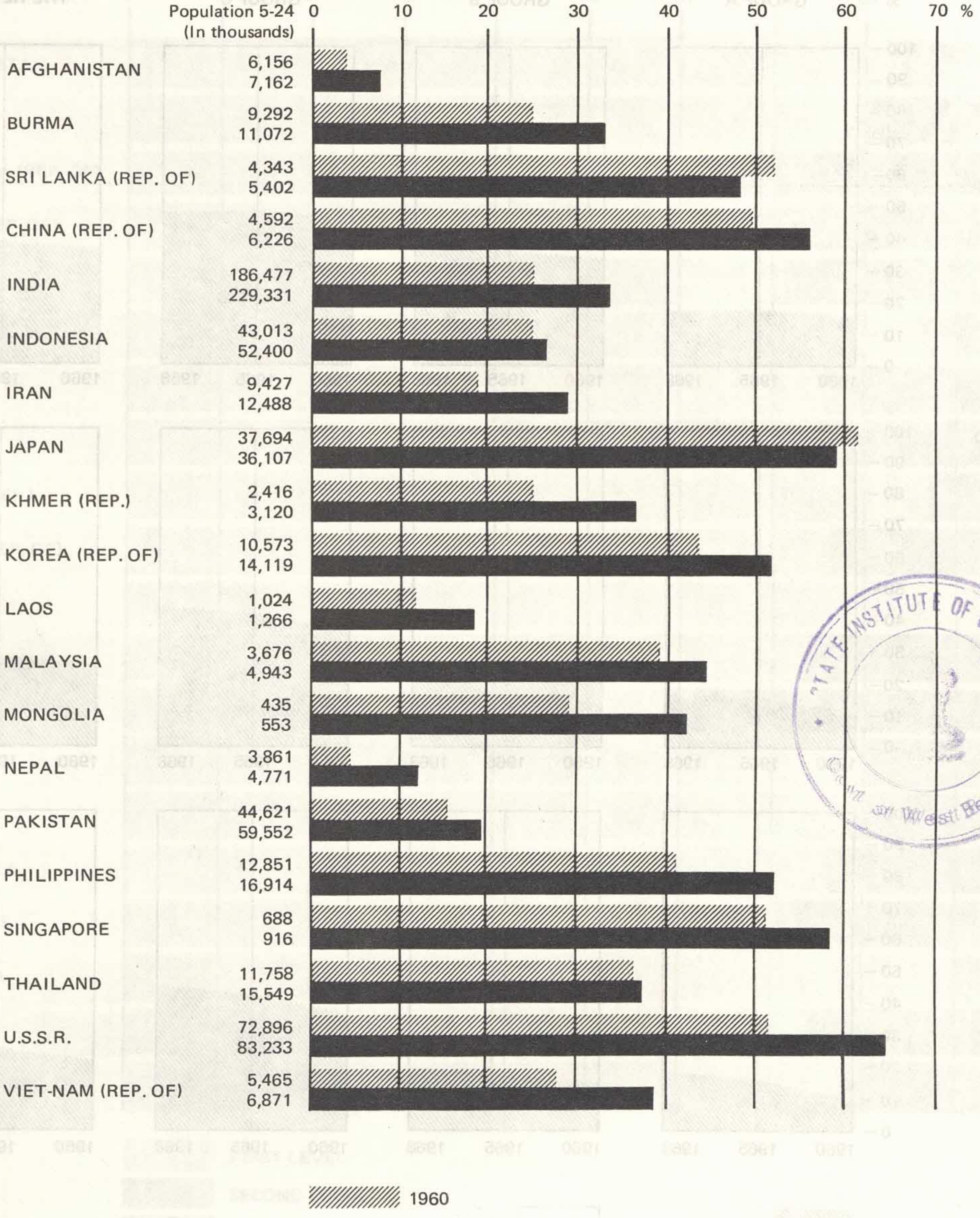
THE POPULATION IN THE ASIAN REGION



NATIONAL EDUCATION SYSTEMS IN THE ASIAN REGION



TOTAL ENROLMENT, ALL LEVELS, AS PERCENTAGE OF THE POPULATION 5-24 YEARS, 1960 AND 1968



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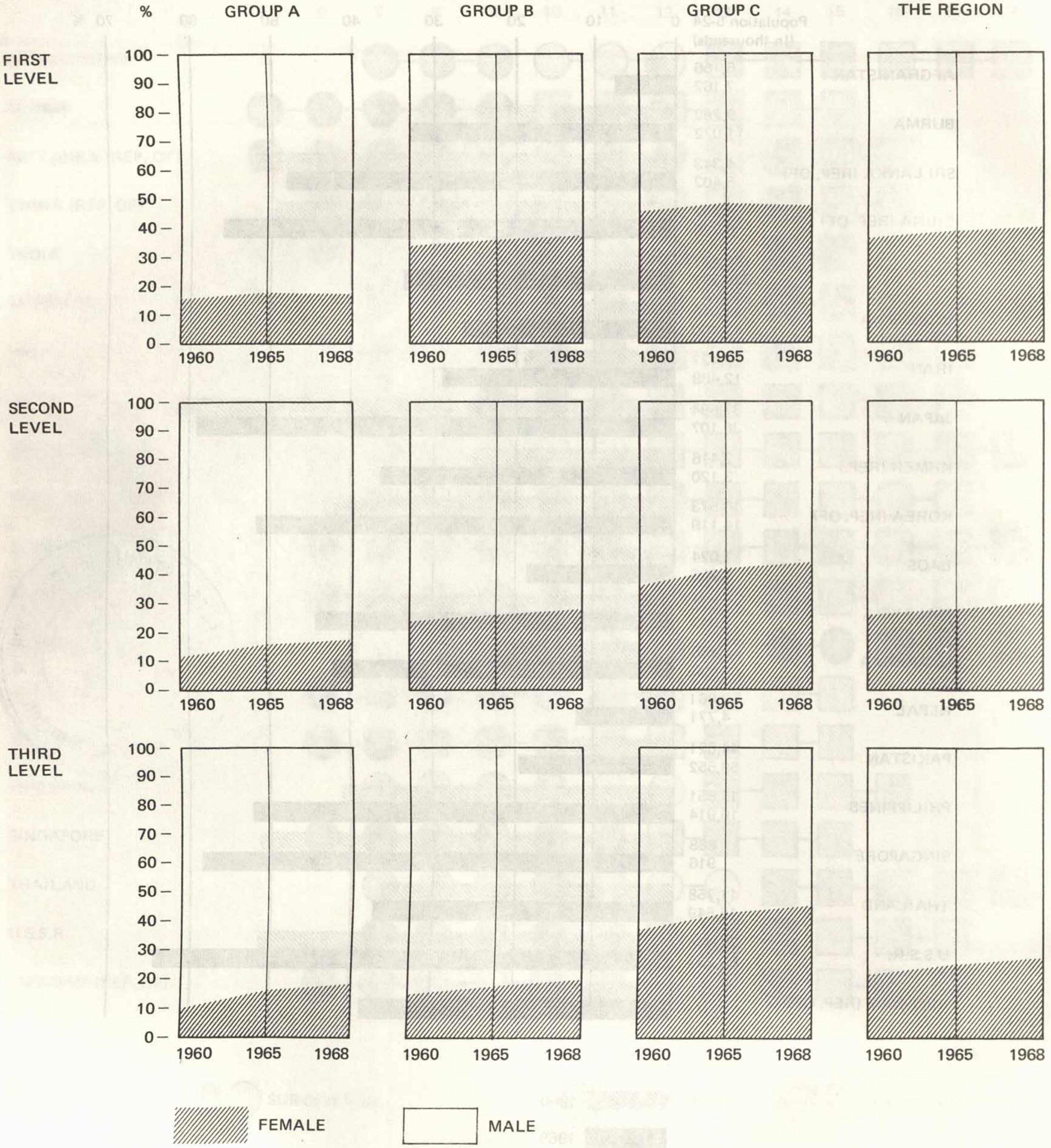
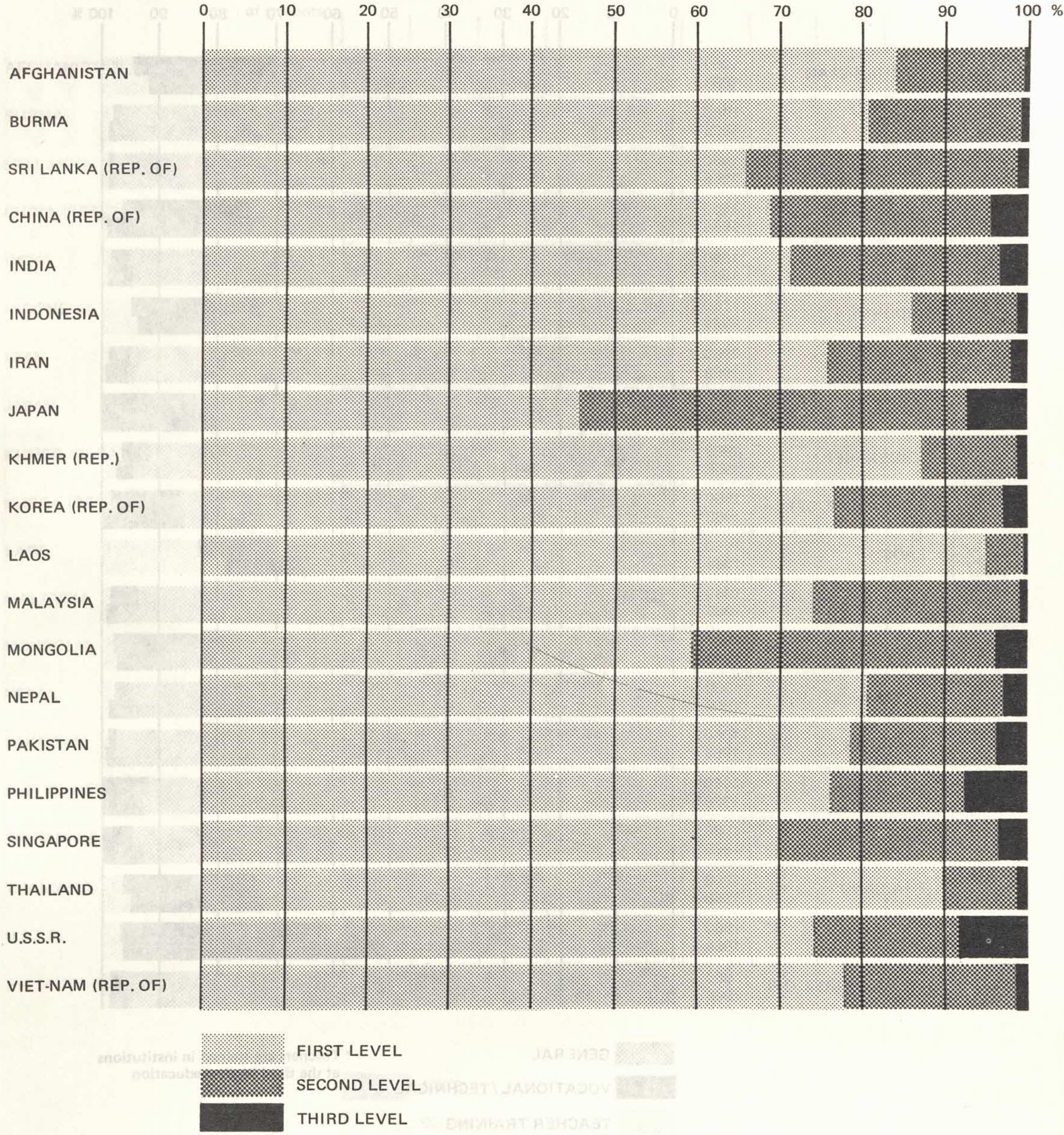
MALE AND FEMALE ENROLMENT BY LEVEL, ASIAN REGION AND GROUPS A, B AND C, 1960-1968

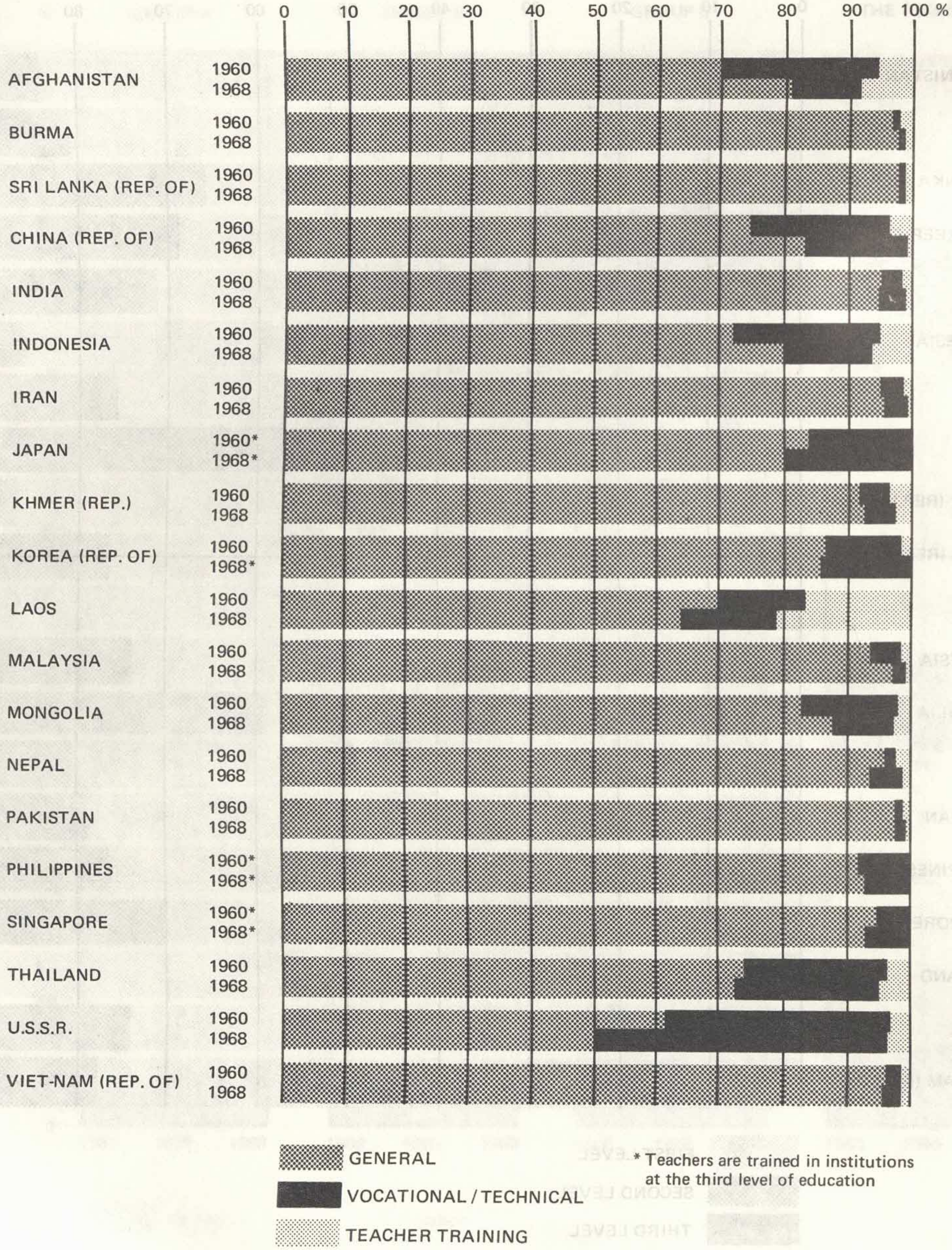
Group A : Afghanistan, Laos, Nepal.
Group B : Burma, India, Indonesia, Iran, the Khmer Republic, Mongolia, Pakistan, Republic of Viet-Nam.
Group C : Republic of China, Republic of Korea, Malaysia, Philippines, Singapore, Republic of Sri Lanka, Thailand.



DISTRIBUTION OF ENROLMENT BY LEVEL OF EDUCATION (1968)



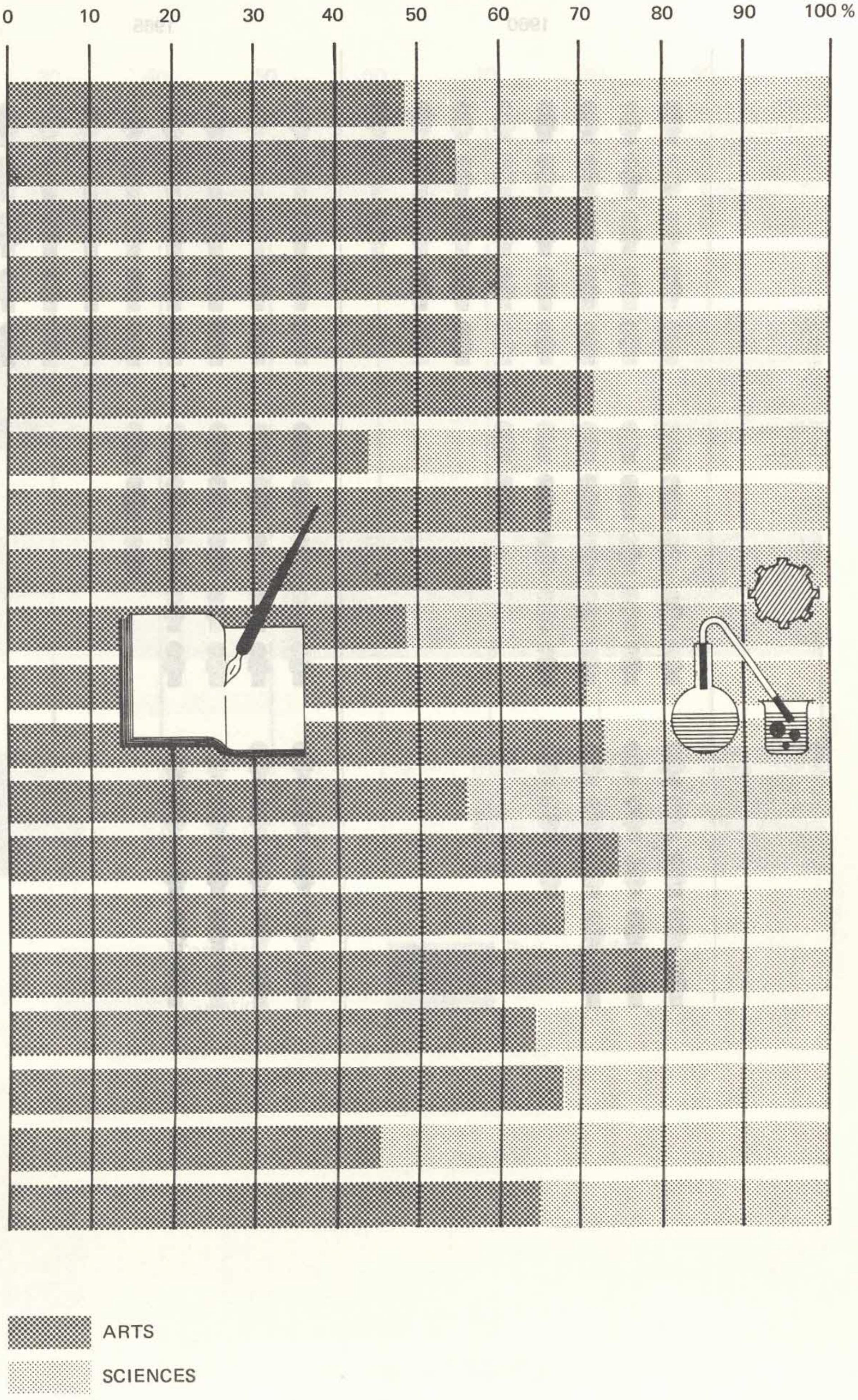
SECOND LEVEL ENROLMENT BY TYPE OF EDUCATION, 1960 AND 1968



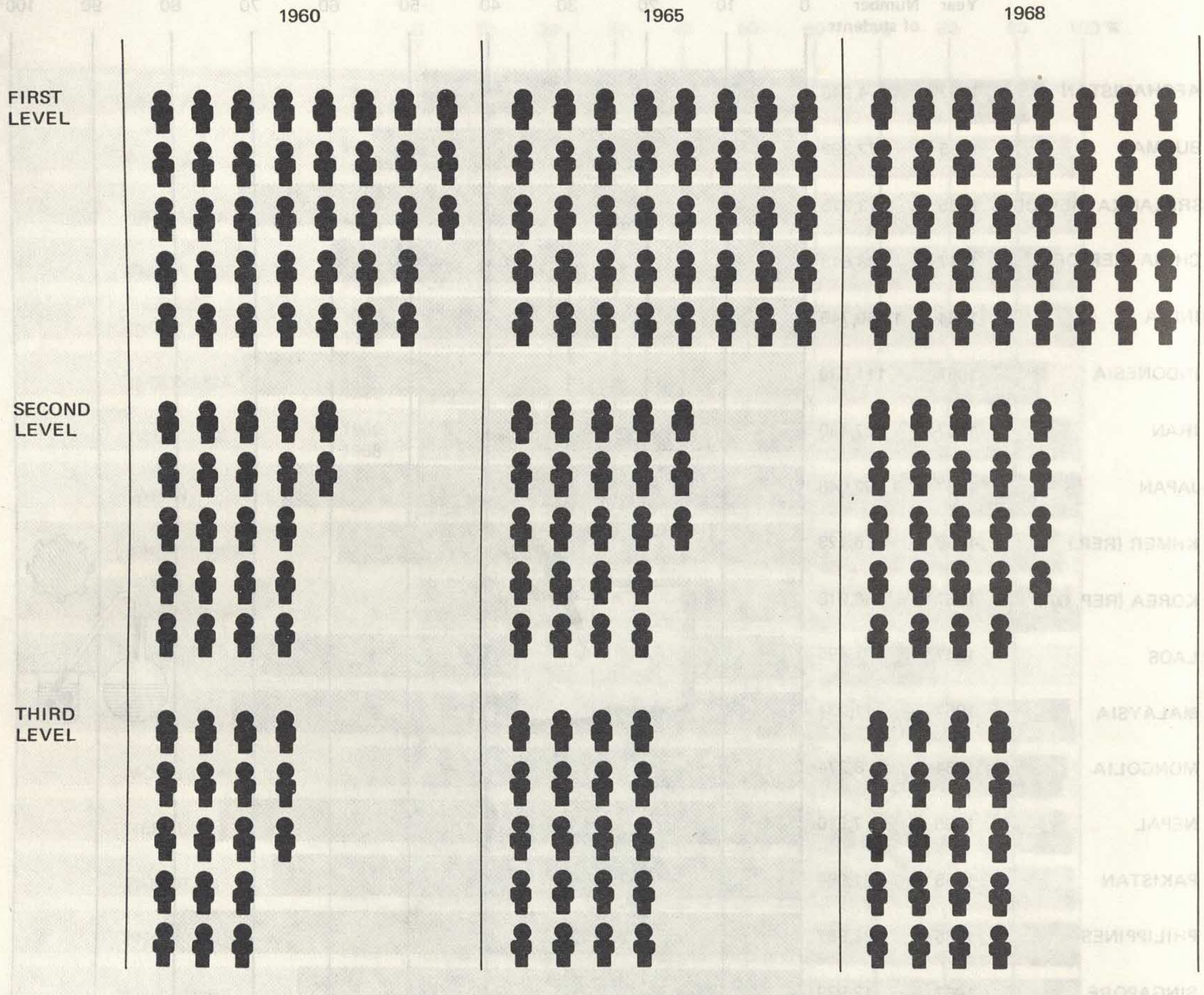
* Teachers are trained in institutions at the third level of education

THIRD-LEVEL ENROLMENT : PERCENTAGE DISTRIBUTION BY ARTS AND SCIENCES

	Year	Number of students
AFGHANISTAN	1967	4,946
BURMA	1965	22,399
SRI LANKA (REP. OF)	1965	13,375
CHINA (REP. OF)	1967	138,613
INDIA	1964	1,260,745
INDONESIA	1967	111,539
IRAN	1967	27,439
JAPAN	1967	1,052,046
KHMER (REP.)	1966	6,123
KOREA (REP. OF)	1967	166,918
LAOS	1967	495
MALAYSIA	1967	11,234
MONGOLIA	1964	8,274
NEPAL	1965	7,516
PAKISTAN	1966	291,954
PHILIPPINES	1965	523,957
SINGAPORE	1967	12,939
THAILAND	1967	36,502
U.S.S.R.	1967	4,310,900
VIET-NAM (REP. OF)	1967	33,929

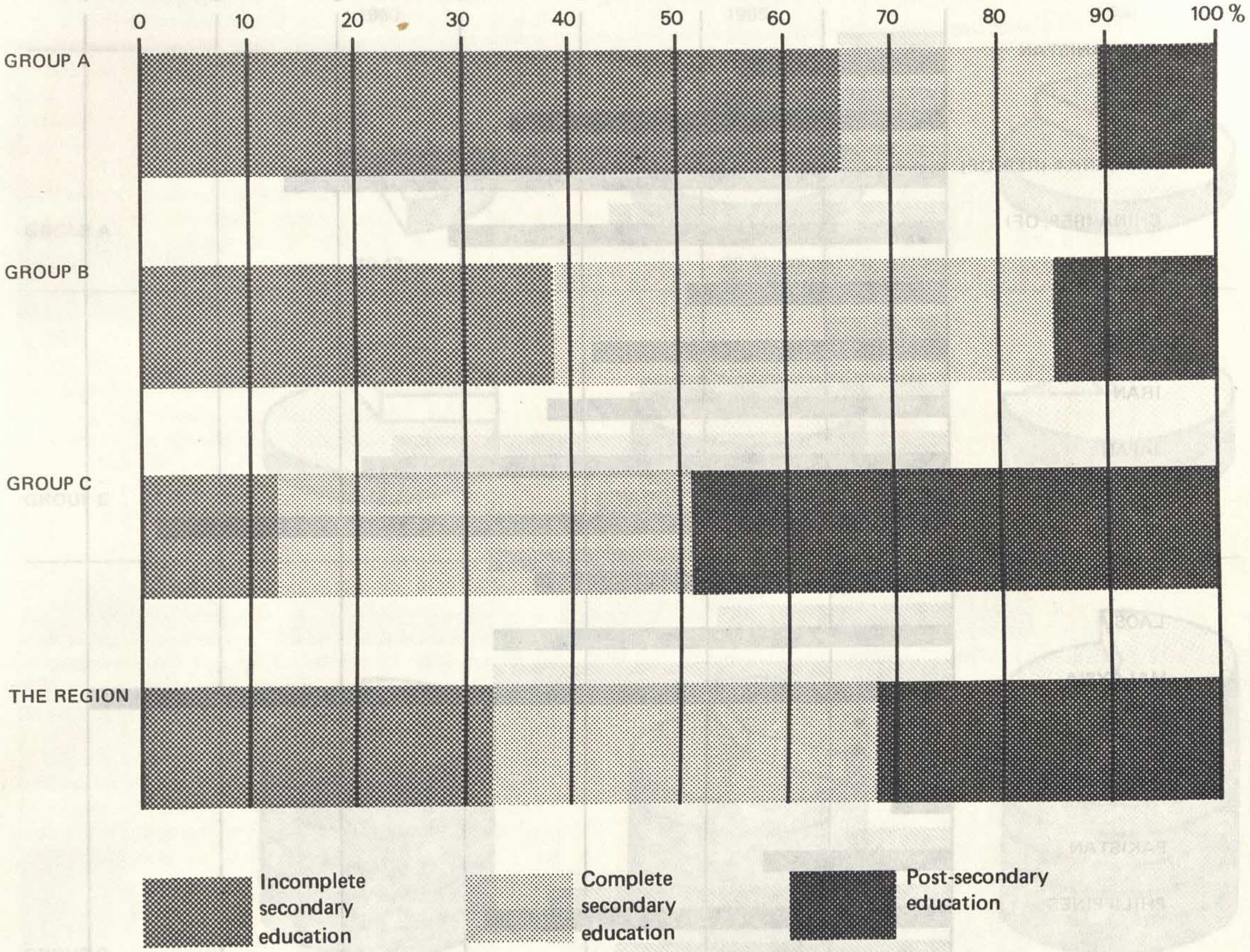


PUPIL-TEACHER RATIO BY LEVELS IN THE ASIAN REGION, 1960-1968



PRIMARY AND SECONDARY (GENERAL) SCHOOL TEACHERS BY QUALIFICATIONS, 1968

Group A : Afghanistan, Laos, Nepal.
Group B : Burma, India, Indonesia, Iran, the Khmer Republic, Mongolia, Pakistan, Republic of Viet-Nam.
Group C : Republic of China, Republic of Korea, Malaysia, Philippines, Singapore, Republic of Sri Lanka, Thailand.



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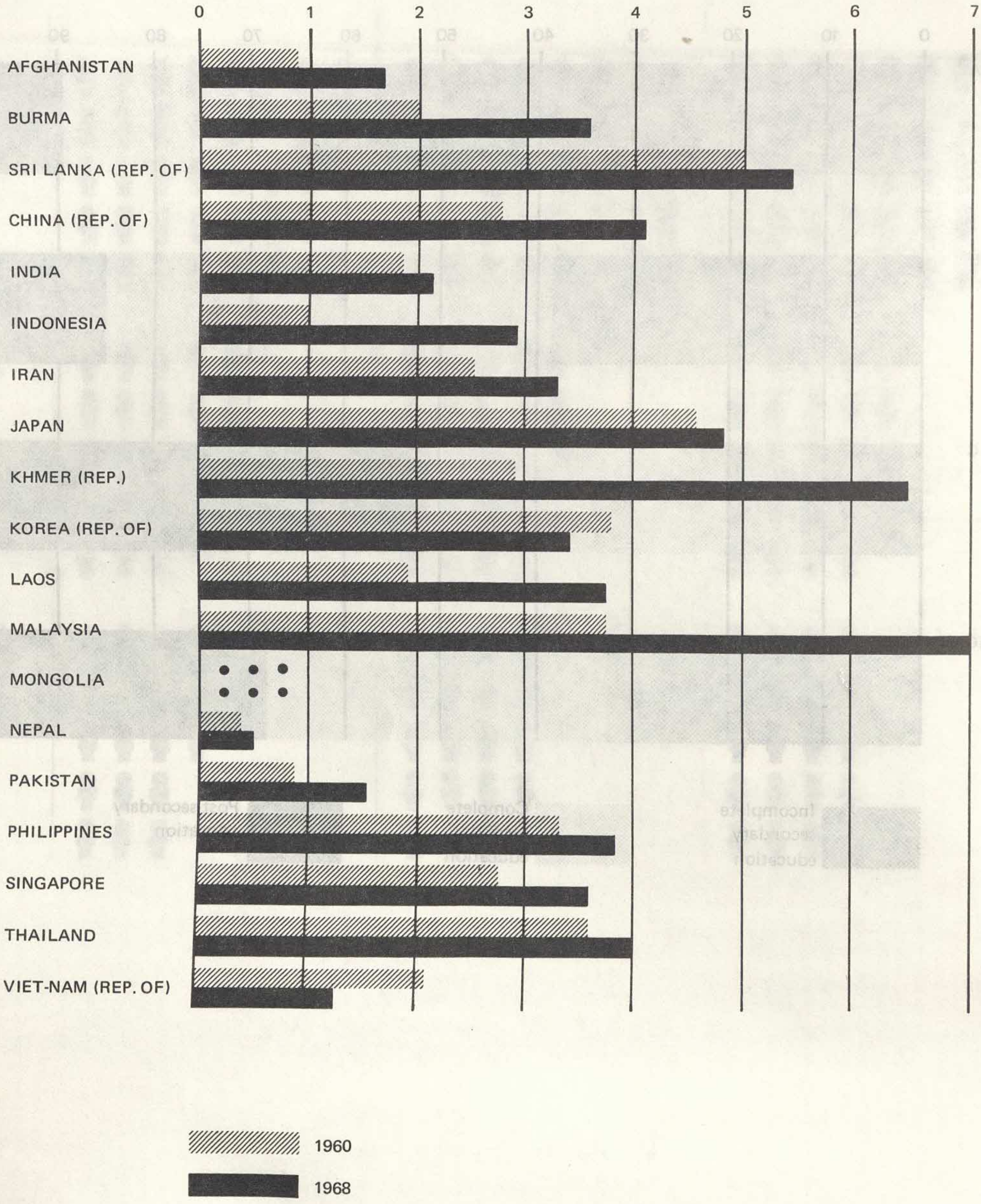
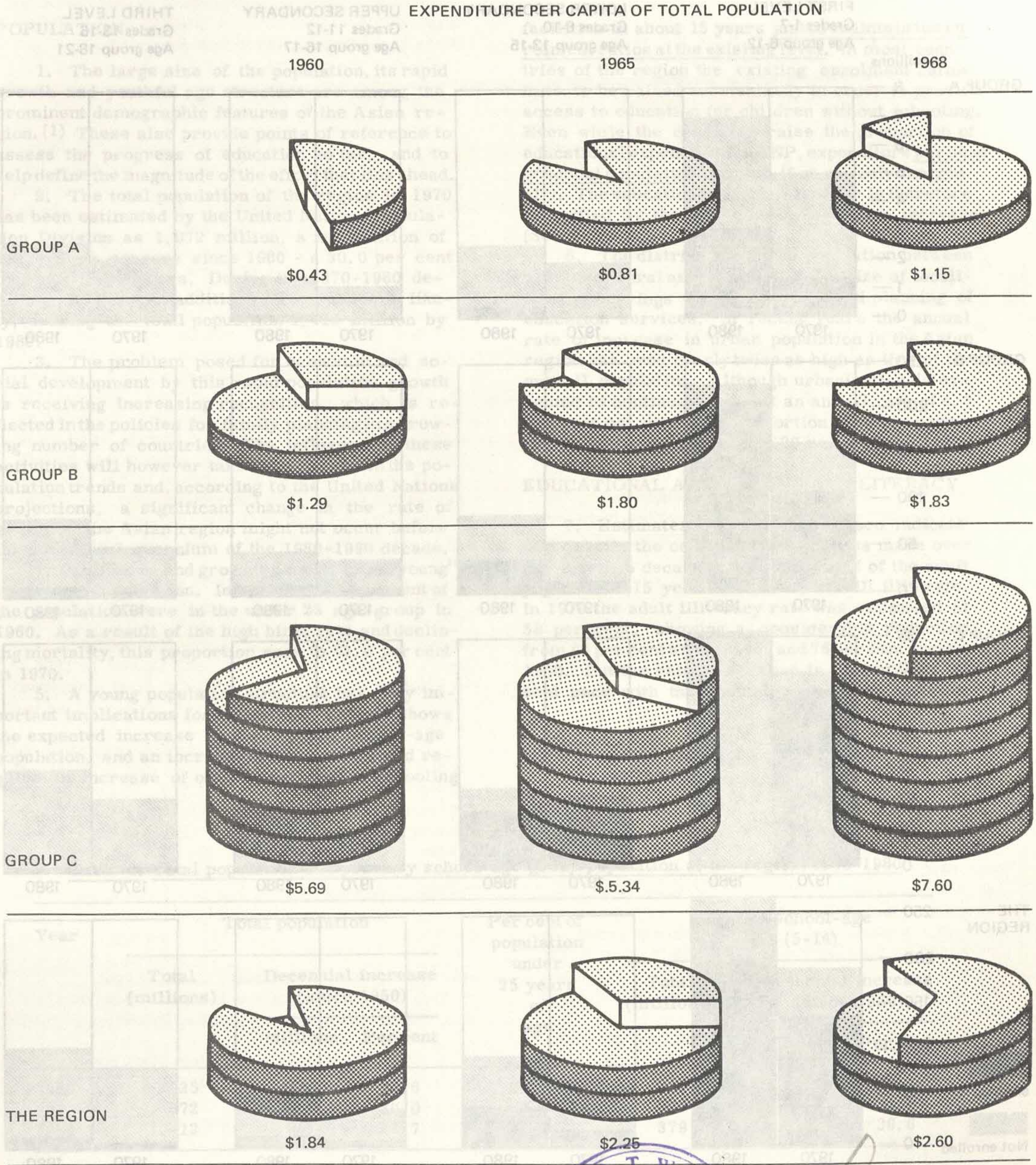
PUBLIC EXPENDITURE ON EDUCATION AS PERCENTAGE OF NATIONAL INCOME, 1960 AND 1968



ESTIMATED PER CAPITA PUBLIC EXPENDITURE ON EDUCATION 1960-1968 (IN US DOLLARS)

Group A :	Afghanistan, Laos, Nepal.
Group B :	Burma, India, Indonesia, Iran, the Kmer Republic, Mongolia, Pakistan, Republic of Viet-Nam.
Group C :	Republic of China, Republic of Korea, Malaysia, Philippines, Singapore, Republic of Sri Lanka, Thailand.



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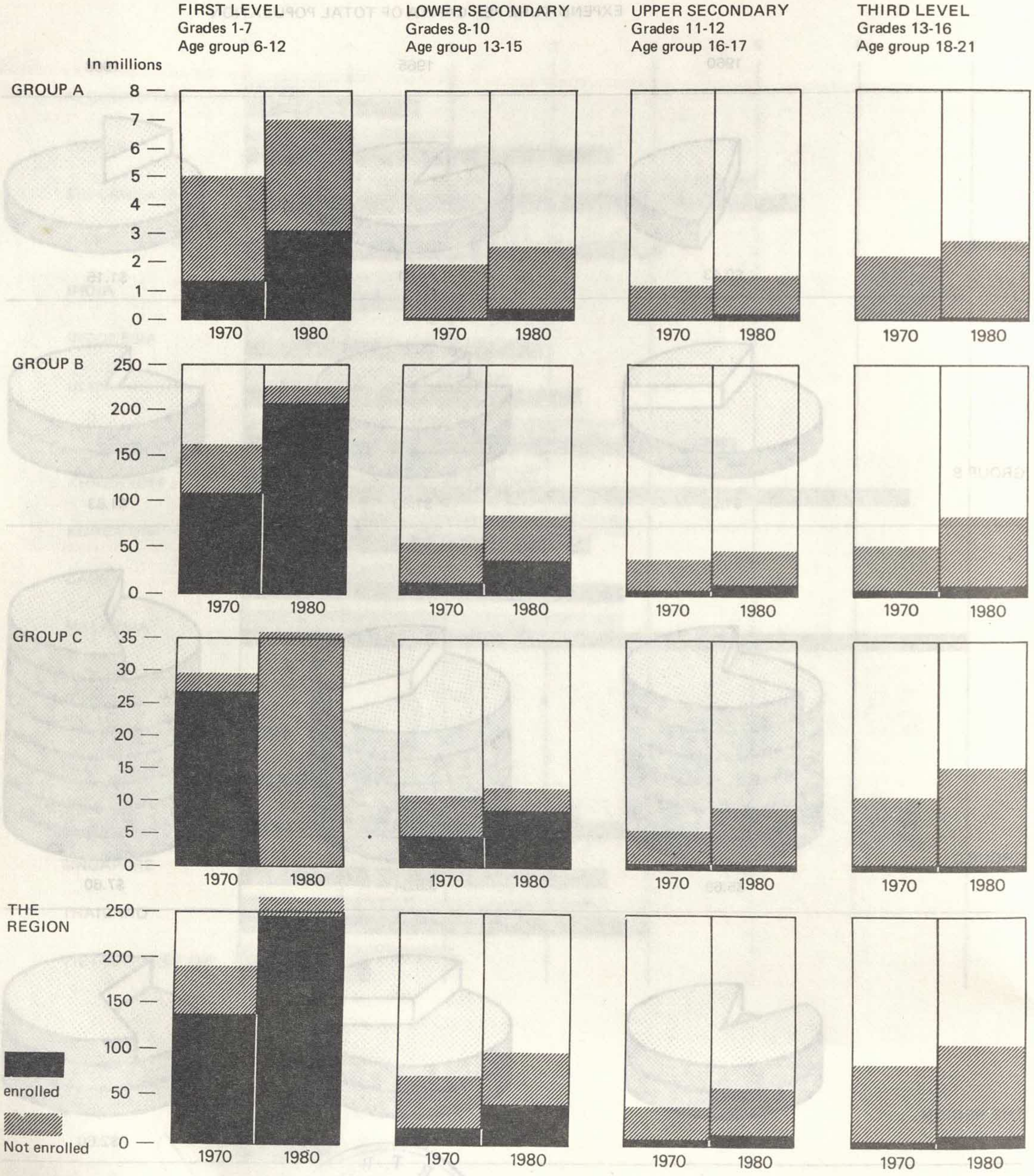
ASIAN MODEL : POPULATION OF SCHOOL AGE ENROLLED AND NOT ENROLLED, 1970 AND 1980

Group A : Afghanistan, Laos, Nepal.
Group B : Burma, India, Indonesia, Iran, the Khmer Republic, Mongolia, Pakistan, Republic of Viet-Nam.
Group C : Republic of China, Republic of Korea, Malaysia, Philippines, Singapore, Republic of Sri Lanka, Thailand.



Chapter 2

A DECADE OF EDUCATIONAL GROWTH

1960-1970

POPULATION

1. The large size of the population, its rapid growth and youthful age structure are among the prominent demographic features of the Asian region.(1) These also provide points of reference to assess the progress of education so far, and to help define the magnitude of the effort that lies ahead.

2. The total population of the region in 1970 has been estimated by the United Nations Population Division as 1,072 million, a net addition of 247 million persons since 1960 - a 30.0 per cent increase in ten years. During the 1970-1980 decade, a further net addition of 340 million is likely, making the total population 1,412 million by 1980.

3. The problem posed for economic and social development by this rapid population growth is receiving increasing recognition, which is reflected in the policies for family planning in a growing number of countries. The influence of these activities will however take time to show in the population trends and, according to the United Nations projections, a significant change in the rate of growth in the Asian region might not occur before the second quinquennium of the 1980-1990 decade.

4. This large and growing population is "young" in its age composition. In Asia, 60.7 per cent of the population were in the under 25 age-group in 1960. As a result of the high birth rate and declining mortality, this proportion rose to 62.0 per cent in 1970.

5. A young population structure has very important implications for education. Table 1 shows the expected increase in the primary school-age population, and an increase of this order would require an increase of over 50 per cent in schooling facilities in about 15 years just to maintain the enrolment ratios at the existing level. In most countries of the region the existing enrolment ratios have to be raised substantially in order to provide access to education for children without schooling. Even while the countries raise the proportion of educational expenditure in GNP, expenditure per head of school population can rise, if at all, only marginally. The educational effort called for is therefore magnified by the high rate of population increase. (See Table 1.)

6. The distribution of the population between urban and rural areas as well as by size of localities has bearings on the provision and planning of education services. In recent years the annual rate of increase in urban population in the Asian region has been nearly twice as high as that of the overall population. Although urbanization is expected to continue to rise at an annual rate of 4.3 per cent per year, the proportion of urban population will still be small, about 20 per cent, by 1980.

EDUCATIONAL ATTAINMENT AND LITERACY

7. Estimates prepared by Unesco indicate that despite the considerable progress made over the last two decades, more than half of the adult population (15 years and over) is still illiterate. In 1970 the adult illiteracy rate was estimated at 58 per cent, showing a considerable reduction from 66 per cent around 1960 and 76 per cent around 1950. But the rate of increase in literacy has not kept pace with the population increase and the

Table 1. Total population and primary school-age group population of the region, 1960-1980

Year	Total population			Per cent of population under 25 years of age	Primary school-age group (5-14)		
	Total (millions)	Decennial increase (since 1950)			Total (millions)	Decennial increase (since 1950)	
		Millions	Per cent			Millions	Per cent
1960	825	168	25.6	60.7	210	47	29.1
1970	1,072	247	30.0	62.0	277	67	31.8
1980	1,412	340	31.7	62.2	379	102	36.6

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(1) For an explanation of the term "Asian region" see the Preface.

absolute number of illiterate adults continues to increase. In 1950 this number was estimated at 307 million, which rose to about 322 million by 1960 and to about 355 million in 1970.

THE GROWTH OF EDUCATION

8. Though the countries of the region are at different stages of development, one element is common to all of them, namely, expansion of enrolments on a scale which has overshadowed all other changes. In consequence, the education systems have expanded in size and are growing in complexity - more institutions and in greater variety, more educational personnel and increasing educational expenditures.

9. In interpreting the aggregate data presented here it is necessary to bear in mind that the national education systems vary in their structure and the levels and stages in which they are divided. Data relating to enrolment, output, etc., have to be seen in the context of these variations in the educational structure. The age at which children are admitted to formal schooling also differs, but the most common ages of entry are six years (ten countries) and five and seven years (three and four countries respectively). The duration of primary schooling ranges from five to eight years, the most common types of courses lasting six years (ten countries), and five years (five countries). The total duration of school education varies from ten to thirteen years; a twelve-year course being the most common (nine countries). Both the duration and age at entry as described above are the legal patterns. In practice, a significant proportion of children join school after or sometimes before attaining the legal school age. Late entry and repetition of grades make for a wide age-spread in each grade

Overall enrolment growth

10. The expansion of enrolments which began in the early 1950s has also continued to be the dominant note in education in Asia during the decade of the 1960s. In the short span of eight years, 1960-1968, the enrolments at all levels increased by 61 per cent, from about 90.3 million in 1960 to 145.7 million in 1968, an average increase of nearly seven million students per year. (See Table 2.)

11. Another measure of enrolment growth is provided by viewing it in relation to the population in the age-group 5-24 years. Table 3 presents these data for the whole region and in terms of Groups of countries.(1)

12. Table 4 presents the average annual rates of increase in enrolment over the periods 1960-1965 and 1965-1968 by levels of education for the region and the three Groups. It discloses a marked trend toward a faster rate of growth at the second and the third levels of education. Compared with the first quinquennium (1960-1965), the expansion during the last three years (1965-1968) slackened markedly at the first level and to some extent at the second level. At the third level a rising rate of increase is observed in all three Groups and in the region as a whole. Resulting from differing annual rates of increase the composition of enrolment by levels of education shows a gradual shift from primary to secondary and higher education.

FIRST LEVEL OF EDUCATION

13. The impetus to widen, and in due course universalize, access to first-level education (of which the Karachi Plan was a reflection) provided the driving force for national endeavours in the decades of the 1950s and the 1960s.

Enrolments in the region increased at an average annual rate of 6.4 per cent during 1960-1965 but slackened to 3.7 per cent in 1965-1968. This slowing down is discernible in all three Groups. In Group A countries which started with a low level of enrolment, the average annual rate in 1960-1965 was 17.7 per cent which came down to 7.7 per cent in 1965-1968. Group B countries also decreased from 6.8 to 3.7. Group C countries are close to universal first-level education and the average annual rate is stabilizing, being determined mainly by the rate of population increase in the relevant age-group rather than the enrolment ratio. The average annual rate in Group C countries was 4.7 per cent during the period 1960-1965 and 3.4 per cent in 1965-1968.

14. Taking the region as a whole, pupil-teacher ratios increased from 38:1 in 1960 to 40:1 in 1968. There are, however, significant variations from one group to another. In Group A, pupil-teacher ratio declined from 38:1 in 1960 to 34:1 in 1968. A similar decline occurred in Group C also, from 39:1 to 34:1. Group B, however, recorded an increase from 38:1 to 42:1.

15. The progress of first-level education in individual countries of the region can be seen with reference to the enrolment ratios. Table 5 shows the progress made in increasing enrolment ratios during the period 1960-1968. The enrolment ratios refer to the proportion of the total enrolment at first-level education to the population in the age-group corresponding to that level. In most of the

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(1) Group A: Afghanistan, Laos, Nepal.
Group B: Burma, India, Indonesia, Iran, the Khmer Republic, Mongolia, Pakistan, Republic of Viet-Nam.
Group C: Republic of China, Republic of Korea, Malaysia, Philippines, Singapore, Republic of Sri Lanka, Thailand.
/The groupings are those adopted in the Asian Model/

Table 2. Total enrolment by level of education in 1960 and 1968

Level	Sex	Number (in thousands) 1960	1968	Increase (%)	Percentage distribution 1960	1968
First level	MF	71,706	109,078	52.1	79.4	74.9
	F	26,446	43,349	63.9	84.7	79.8
Second level	MF	16,702	32,275	93.2	18.5	22.1
	F	4,344	9,801	125.6	13.9	18.0
General	MF	15,617	30,221	93.5	17.3	20.7
	F	4,056	9,097	124.3	13.0	16.7
Vocational	MF	874	1,722	97.0	1.0	1.2
	F	225	577	156.4	0.7	1.1
Teacher training	MF	211	332	57.3	0.2	0.2
	F	63	127	101.6	0.2	0.2
Third level	MF	1,852	4,361	135.5	2.1	3.0
	F	421	1,192	183.1	1.4	2.2
Total	MF	90,260	145,714	61.4	100.0	100.0
	F	31,211	54,342	74.1	100.0	100.0

Table 3. Enrolment at all levels as percentage of the population 5-24 years: the region and Groups A, B and C, 1960 and 1968

Item	Year	Group A	Group B	Group C	The region
Population 5-24	1960	11.0	301.1	48.5	360.7
(millions)	1968	13.1	374.5	63.9	451.5
Increase	1960-1968	(19%)	(24%)	(32%)	(25%)
Enrolment (all	1960	0.47	69.3	20.5	90.3
levels) (millions)	1968	1.34	113.8	30.6	145.7
Increase	1960-1968	(185%)	(64%)	(49%)	(61%)
Total enrolment					
as percentage of	1960	4.3	23.0	42.2	25.0
population 5-24	1968	10.2	30.4	47.9	32.3

Table 4. Average annual rate of increase in enrolment by level of education and groups of countries 1960-1968 (percentages)

Level of education	Period	Group A	Group B	Group C	The region
First level	1960-1965	17.7	6.8	4.7	6.4
	1965-1968	7.7	3.7	3.4	3.7
Second level	1960-1965	12.7	9.3	8.8	9.2
	1965-1968	18.4	7.3	8.0	7.5
Third level	1960-1965	12.5	11.2	10.8	11.1
	1965-1968	21.1	11.9	10.5	11.6

countries, the enrolled population does not represent the specific age-groups: children below or above the age range also enrol. There is thus an element of overestimation in figures of enrolment ratios. The age composition of enrolled children in a grade is further complicated by the high incidence of repetition. It will thus be seen that a typical class in school would represent a very wide range of variations in pupils as regards their age, their social background, interests, abilities and learning readiness.

16. Wastage in education in the form of repetition of grades and dropping out or premature school leaving continue to be the most important problems of educational development at the first level of education in many Asian countries.

Due to the very national nature of this problem, in terms of distinguishing repeaters and drop-outs, it can best be studied with reference to conditions in individual countries. In connexion with a survey(1) conducted by Unesco in 1969, seven countries in the region provided repetition data which make it possible to construct for these countries a "promotion and drop-out profile". Four of these countries (India, Iran, the Khmer Republic and Thailand) allow grade repetition while the other three countries (Republic of China, Republic of

Table 5. School enrolment ratios at the first and second levels of education, 1960 and 1968 (percentages)

Country	1st & 2nd levels combined 1960	1st & 2nd levels combined 1968	First level 1960	First level 1968	Second level 1960	Second level 1968
Combined ratio above 60% in 1968						
Philippines	69	90	91	116(1)	29	42(1)
Singapore	78	83	111	109	33	52
China, Republic of	73	77	102	104	29	46
Korea, Republic of	66	74	96	105	29	36
Mongolia	51	71	73	102	33	47
Malaysia	56	62	89	89	15	33
Sri Lanka, Republic of(2)	71	69	86	85	28	33
Combined ratio between 40-60% in 1968						
Viet-Nam, Republic of	46	58	101	91	10	25
Thailand	59	56	84	79	13	15
Burma(2)	38	53	72	89	10	18
Khmer Republic	36	52	62	90	5	11
India	30	49	61	79	17	23
Iran	27	43	39	60	11	21
Indonesia	36	42	60	68	6	11
Combined ratio below 40% in 1968						
Pakistan	24	32	34	47	9	15
Laos	13	25	25	46	0.9	3
Nepal	13	20	20	31	4	7
Afghanistan	5	12	8	20	0.9	4

Note. Countries are arranged in descending order according to the combined ratio for the first and second levels in 1968. The relevant age-groups for the first and second levels are those computed with reference to the duration of each level in the national structure of education.

(1) 1967.

(2) Due to a change in the duration of first and second levels, the ratios for 1960 and 1968 are not strictly comparable.

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(1) The problem was the theme of the XXXIInd session of the International Conference on Education (Geneva, 1-9 July 1970). The main working document for this conference: The Reduction of Educational Wastage (ED/BIE/CONFINTED 32/4) Paris, March 1970, and the reference document: The Statistical Measurement of Educational Wastage (ED/BIE/CONFINTED 32/Ref. 1) Paris, 24 June 1970, present a comprehensive analysis of the existing situation from the twofold aspect of the numerical incidence of wastage and the various methods of selection and promotion, followed by a study of the principal socio-economic and educational causes, and suggestions as to possible remedies.

Korea and Malaysia (West)) have adopted a system of automatic promotion. The data for these countries are presented in Table 6 to illustrate the problem of wastage.

17. The indices of wastage are of interest in describing the internal efficiency of the education system. The unit cost of wastage for a cohort is the total number of pupil-years absorbed by a cohort before completing or leaving a stage, divided by the number of pupils successfully completing the stage. The input-output ratio is the total number of pupil-years invested in a cohort expressed as a ratio of the minimum number of pupil-years required by those pupils who completed the stage.[1]

The input-output ratio indicates that the effective output from the system "costs" in the Khmer Republic, for example, nearly two and a half times (2.48) as much in terms of pupil-years invested as would have been minimally required, in India (1.78), Iran (1.26), and Thailand (1.31). On the other hand, in countries such as the Republic of China, the Republic of Korea and Malaysia, which have "automatic promotion" systems the input-output ratio is near the optimum.

SECOND LEVEL OF EDUCATION

18. Enrolments in the second level of education have increased at a much faster rate than those at the first level, and have kept well ahead of the increase in the relevant school-age population. In the period 1960-1965 second-level enrolments increased at an average annual rate of 9.2 per cent;

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[1] Sources noted in footnote on page 26 should be consulted for detailed methodology and discussion.

Table 6. Indices of educational wastage at the first level in some Asian countries

Country	Normal duration (years) A	Unit-cost (pupil-years invested) B	Input/output ratio B/A	Overall drop-out[1]	Output by number of repeating years[1] Total	0	1	2	3	4+
China, Republic of	6	6.21	1.04	88	912	912	-	-	-	-
India	5	8.91	1.78	549	451	155	153	92	51	-
Iran	6	7.55	1.26	221	779	390	268	121	-	-
Khmer Republic	6	14.9	2.48	640	360	88	109	83	48	32
Korea, Republic of	6	6.38	1.06	132	868	868	-	-	-	-
Malaysia (West)	6	6.65	1.11	155	845	845	-	-	-	-
Thailand										
Lower stage	4	5.25	1.31	179	821	393	270	114	44	-
Upper stage	3	3.42	1.14	137	863	723	119	21	-	-

(1) Based on an initial intake of 1,000 pupils in Grade I.

Table 7. Third level of education: percentage distribution of enrolment by fields of study, the region and groups, around 1965

Field of study	Group A	Group B	Group C	The region
Arts[1]	63.3	58.2	73.3	63.4
Sciences	36.7	41.8	26.7	36.6
Total	100.0	100.0	100.0	100.0
Actual number (thousands)	(8.3)	(1,561)	(816)	(2,385)
Percentage distribution by science fields				
Natural sciences	62.0	64.9	12.9	52.0
Engineering	10.1	14.6	50.5	23.5
Medical sciences	23.8	14.7	23.1	16.8
Agriculture	4.1	5.8	13.5	7.7
Total science	100.0	100.0	100.0	100.0

(1) Comprises: humanities, education, fine arts, law and social sciences.

but dropped to 7.5 per cent in 1965-1968. Countries in Group A have recorded the highest increase, being 12.7 per cent in 1960-1965 and 18.4 per cent in 1965-1968. Countries in Group C have maintained a stable but high rate of increase, 8.8 per cent in 1960-1965 and 8.0 per cent in 1965-1968. Countries in Group B had a growth rate of 9.3 per cent in 1960-1965 which dropped to 7.3 per cent in 1965-1968.

19. The total enrolment in second level(1) nearly doubled but the increase in the number of teachers was somewhat less. The pupil-teacher ratios therefore tended to increase. For the region as a whole it rose from 22:1 in 1960 to 24:1 in 1968. Group A and C mainly contributed to this increase while Group B was stable. In Group A pupil-teacher ratio increased from 18:1 in 1960 to 23:1 in 1968 and in Group C from 25:1 to 30:1.

THIRD LEVEL OF EDUCATION

20. The rate of enrolment increase at the third level has been higher than that at the first or the second levels. The annual rate of growth was 11.1 per cent during the first quinquennium (1960-1965) and 11.6 per cent during the next three years (1965-1968). Enrolment at the third level in proportion to total enrolment, at all levels, rose from 2 per cent in 1960 to 3 per cent in 1968.

21. Third-level enrolment expressed in terms of the number of students per 100,000 of total population, shows a rapid increase in all countries over the eight-year period (1960-1968).

Number of students at the third level, the region and groups of countries, 1960-1968
(Per 100,000 of total population)

	1960	1965	1968
Group A	26	42	70
Group B	194	292	376
Group C	467	673	831
The region	225	336	429

22. The distribution of students by fields of study is presented in Table 7 for the region and for Groups of countries. The predominance of the "arts" subjects is the common feature in all three Groups, being markedly more pronounced in Group C. The distribution of third-level enrolment between "arts" and "sciences" shows wide variations among countries of the region. Around 1965 the proportion in "sciences" was less than 30 per cent in five countries, between 30-40 per cent in seven countries and 40-47 per cent in the remaining six countries.

23. Statistical data concerning admission examinations are very scarce, though in most countries entrance to university requires students to pass such examinations. The limited data available show a large and growing gap between the number of applicants and those who are admitted. The statistics for Afghanistan, for example, reveal that in 1968 the University of Kabul admitted 1,372 new students out of 3,413 sitting the entrance examination, or 40 per cent. In the Khmer Republic, for the academic year 1968-1969, there were 21,684 candidates sitting for various entrance examinations and only 5,713, or 26 per cent, were accepted. In the Republic of Sri Lanka, 30,570 students sat for the G.C.E. (A level) examination in 1967, and only 3,690 or 12 per cent were admitted to universities the following year. In the Republic of Korea the statistics for 1968 show that there were about 127,000 applicants for about 55,000 places in higher institutions. In Thailand, in 1968, there were over 25,000 applicants of whom only 8,585 could be accepted for admission.

The emerging picture is clear enough: everywhere the pressure for admission is mounting and facilities are not adequate to absorb it.

24. Post-graduate education has a leading rôle in the development of higher education. Almost all countries in the region now have facilities for post-graduate studies at Master's degree level. Some of the countries have also developed facilities for studies at doctoral and research level. The number of post-graduate students, however, is still small both in absolute terms and as a proportion of the total enrolment at the third level. Post-graduate facilities in the countries are supplemented by students studying abroad, a majority of whom are engaged in post-graduate studies. Around 1966, 77,000 nationals of the countries of the region were studying abroad - 9,000 were studying in the countries within the region and the remaining 68,000 were in institutions outside the Asian region.

TEACHING STAFF

25. In the period 1960-1968 the total number of teachers at all levels rose from about 2.7 million in 1960 to 4.3 million in 1968. This represents an average addition of more than 200,000 teachers every year. A higher proportional increase occurred at the second level (83 per cent) and the third level (113 per cent), as compared to the first level of education (47 per cent).

26. As will be seen from table 8, of the 1.6 million teachers added during the period 1960-1968, 884 thousand (55 per cent) were at the first level, 621 thousand (38 per cent) at the second level and 113 thousand (7 per cent) at the third level.

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(1) Refer to Table 2 for data on the growth of second-level education by type of secondary education and to Table 5 for second-level enrolment ratios for the individual countries.

Table 8. Total teachers by level of education and sex 1960, 1965, 1968 (in thousands)

Level	Sex	Year 1960	Year 1965	Year 1968
First level	MF	1,865	2,417	2,749
	F	472	699	841
Second level	MF	752	1,113	1,372
	F	179	266	357
General	MF	679	1,003	1,248
	F	...	...	...
Vocational	MF	55	86	97
	F	...	...	...
Teacher training	MF	18	24	27
	F	...	...	...
Third level	MF	100	159	213
	F	17	32	47
Total	MF	2,717	3,689	4,334
	F	668	997	1,245

STATE INSTITUTE OF EDUCATION West Bengal

Table 9. Estimated output and requirement of trained teachers. The region and Groups, around 1968 (in thousands)

	Group A	Group B	Group C	The region
Output of trained teachers(1)	2.5	199	79	281
Teaching force (T.F.)(2)	40.1	3,098	859	3,997
Annual increase in T.F. (a) (average over period 1965-1968)	3.6	143	46	193
Teachers needed for replacement (at 6 per cent per year) (b)	2.4	186	52	240
Total requirement of teachers (a+b)	6.0	329	98	432
Output of trained teachers as per cent of:				
Total requirement of teachers	42%	60%	81%	65%
Teaching force	6.2%	6.4%	9.2%	7.0%

(1) Refers to the number of primary and secondary general school teachers trained in all teacher-training institutions at the second and third levels (including faculties of education) in the region around 1968.

(2) Total number of primary and secondary general school teachers.

27. The number of graduates from all teacher-training institutions (at the second and third levels, including faculties of education) was about 281,000 for the whole region around 1968. This was to meet the demand for new teachers and the replacement of teachers who had retired, died or otherwise left the teaching profession. The number of additional teachers required for replacement alone was estimated at 240,000 per year (at the rate of 6 per cent replacement). The average annual increase in the teaching force during the period 1965-1968 was of the order of 193,000. It would thus appear that the output of teacher-training institutions for primary and secondary education was well below the demand (Table 9).

28. The shortage in the supply of trained teachers arises from inadequate training capacity rather than any limitation of supply at the source (that is, secondary and higher education systems) from which the prospective teachers are drawn. In all countries of the region, except possibly Group A, the output of secondary and higher education systems is sufficient to ensure an adequate supply to the teaching profession. The shortage lies in training places.

GIRLS' EDUCATION

29. The achievement of an adequate level of educational facilities in the Asian region is contingent on correcting the existing imbalance in the enrolment ratios for boys and girls. For the whole region the enrolment ratio for boys in 1968 is estimated at 39.6 per cent, compared with 24.7 per cent for girls. As will be seen from Table 10 the disparity is greater in Group A with an enrolment ratio for boys over four times higher than that of girls. In Group B the enrolment ratio for girls is substantially less than that of boys, whereas in Group C the difference is slight.

30. There is increasing awareness and concern over the serious economic and social implications of the existing imbalances and efforts have been made in every country to expand the education of girls. The gap between the enrolment of boys and girls has consequently been narrowing steadily over recent years in all countries and at all three levels of education, as shown in the data for the region in Table 11.

31. Analysis of the data for various countries in the region by level of education shows that in first-level education the problem centres on countries in Groups A and B and is more acute in rural areas than among the urban population. Enrolment of girls in rural areas lags behind boys' enrolment by as much as 15-35 per cent. The size of girls' enrolment in these countries is further eroded by the incidence of drop-out, the rate of which is higher among girls, particularly in the beginning grades of primary education.

32. An important index of the growth of girls' education is provided by the number of women teachers in the teaching force. An increase in the number of women teachers has twofold significance: it ensures that the special problems of girls under schooling are handled by teachers who understand these problems, and it indicates in the developing countries an emerging employment orientation among women.

There was a significant increase in the percentage of women teachers during the period under review, as table 12 will show.

EXPENDITURE ON EDUCATION

33. The limitations of the statistical data relating to educational expenditure must be borne in mind. In many cases, data on educational expenditure refer only to the expenditure of the Ministry of Education. Even more important, they do not cover the expenditure incurred in the private sector of education except for grants and loans from public revenues that may be given to private schools. In many countries of the region, private schools form a substantial part of the total education system. A review of the total educational expenditure should obviously include expenditure incurred in the private sector, but since data on such expenditure are not available, educational expenditure in this discussion refers only to public expenditure.

Between 1960 and 1968 public expenditure on education increased by an annual average rate of 7.2 per cent for the whole region. There were marked variations between Groups of countries which may partly be due to differing rises in the prices for teachers' services, etc. In Group A countries the annual average increase was highest, (15.5 per cent) while Group B recorded 7.4 per cent and Group C, 6.8 per cent.

34. Table 13 below shows the number of countries in each Group by the share of public expenditure on education in the total national income and the share of public educational expenditure in the total national income and the share of public educational expenditure in the total public expenditure.

35. There was a perceptible increase in the number of countries which are moving up to a higher level of public expenditure on education with reference to the national income. In regard to the share of educational expenditure in the total public expenditure there are important variations as between different countries, as well as fluctuations from year to year. Nevertheless, the general trend indicates a rise in the percentage of educational expenditure in the total public expenditure during the period under review.

36. Table 14 (page 32) gives the estimated total public expenditure on education and per capita by Groups of countries for 1960, 1965 and 1968.

37.. If Table 14 is read in conjunction with the data presented earlier on enrolment increases, it would appear that while a substantial part of the increase in educational expenditure has been caused by an increase of enrolment, there has also been an increase in unit expenditure.

In almost all countries allocations for the second and third levels of education show a marked rising trend. This is likely to continue in the present decade also, strengthened by the trends of increasing enrolments at the second and third levels of education. Since the unit cost is much higher at these levels, the overall per student expenditure is likely to increase substantially in the coming years. Allocations for the first level, although showing a declining trend, still form a substantial proportion of total educational expenditure. Increases in the allocations for the second level have gone mainly into general secondary education. Vocational and technical education has gained but not to an extent that would reflect a fundamental change in the pattern of secondary education.

Table 10. Enrolment, all levels, as percentage of the population 5-24 years, by sex, the region and groups, 1960 and 1968

	Group A	Group B	Group C	The region
1960				
Boys	7.0	31.0	46.0	32.3
Girls	1.4	14.8	38.3	17.6
1968				
Boys	16.3	38.7	49.8	39.6
Girls	3.7	21.8	45.9	24.7

Table 11. Female enrolment as percentage of total enrolment, by level of education and groups, in the Asian region, 1960-1968

Level of education	Year	Group A	Group B	Group C	The region
First level	1960	17	34	46	37
	1965	18	37	48	39
	1968	18	38	48	40
Second level	1960	12	24	37	26
	1965	16	26	42	29
	1968	17	28	43	30
Third level	1960	12	16	39	23
	1965	18	19	44	26
	1968	19	21	46	27
All levels	1960	17	32	45	35
	1965	18	34	46	37
	1968	18	35	47	37

Table 12. Female teachers as percentage of the total teaching staff, by levels of education, the region, 1960-1968

Level of education	1960	1965	1968
First	25	29	31
Second	24	24	26
Third	17	20	22
All levels	25	27	29

Table 13. Public expenditure on education in the region compared with national income and with total public expenditure, 1960 and 1968

Public expenditure on education as percentage of national income	Number of countries(1) 1960	Number of countries(1) 1968
1% or less	4	1
1.1 to 2.0%	4	3
2.1 to 3.0%	5	2
3.1 to 4.0%	3	6
4.1 to 5.0%	1	2
Over 5.0%	-	3
	17	17

Public expenditure on education as percentage of total public expenditure	Number of countries(1) 1960	Number of countries(1) 1968
10% or less	6	5
11% to 15%	3	5
16% to 20%	5	3
21% to 25%	1	2
Over 25%	2	2
	17	17

(1) Excluding Mongolia

Table 14. Estimated public expenditure on education, 1960-1968 (in thousands of U.S. dollars)(1)

Group of countries	1960	1965	1968	Index (1960=100)		
				1960	1965	1968
Group A	10,800	22,500	34,100	100	208	316
Group B	917,600	1,462,000	1,629,200	100	159	178
Group C	616,800	674,800	1,047,600	100	109	170
Asian region	1,545,200	2.159,300	2,710,900	100	140	175

Group of countries	Per capita of total population		
	1960	1965	1968
Group A	0.43	0.81	1.15
Group B	1.29	1.80	1.83
Group C	5.67	5.34	7.60
Asian region	1.84	2.25	2.60

(1) An important consideration in interpreting these data arises from the fact that the true level of expenditure is not accurately reflected in data based on a conversion of national currencies into an international dollar equivalent, since by far the major part of the national expenditure on education is spent domestically.

II. GROWTH AND CHANGE

Chapter 3

FRAMEWORK FOR POLICY: SOME COMMON PROBLEMS AND ISSUES

1. Educational development in Asia during the post-war decades was marked by a high rate of enrolment expansion. National plans and policies in that period were expressed mainly in terms of enrolment targets. By and large, this expansion took place within the existing framework of education; the educational goals implicit in it were taken for granted. Educational policy was more in the nature of a response to aspirations and pressures that arose from a rapidly changing social situation rather than a positive approach defining the aims and purposes of education in the newly emerging economic, social and cultural context and devising the structural and curricular means for achieving them.

2. The analyses made by National Commissions/committees as well as recent national policy statements and plans reflect increasing awareness of the fact that educational policy now, as distinguished from the earlier phase, has to be formulated within the wider perspectives of economic, social and cultural issues, and on a longer time-scale. It has to deal not only with present problems but, even more important, lay the ground work for the future. The problems thus identified stem principally from the following areas of concern:

access to education;
adapting the rôle of education in national development;
structure and balance of education systems;
operating efficiency of education systems;
problem of educational resources; and
quality of education.

Access to education

3. In the last two or three decades, education systems have expanded on a scale without precedent in their history. The very pace and scale of expansion and the social aspirations which underlie them, have thrown into relief the uneven distribution of educational opportunities. This disparity relates to one of the fundamental human rights - the right to education.

4. It is significant that in the same year - 1960 - in which Unesco convened in Karachi the first Regional Conference to Examine Long-Term Educational Development in Asia, the General Conference of the Organization - at its eleventh session - adopted the Convention and Recommendation against Discrimination in Education.

These two instruments combine two distinct but complementary aspects of the same educational objective: the realization of the right to education for everyone by the elimination and prevention of all forms of discrimination, on the one hand, and the promotion of equal opportunity and treatment in education, on the other.

5. Although in most countries there has been considerable progress in recent years towards equality of educational opportunities for girls, notably in the primary and secondary levels, the overall picture for the region still shows significant gaps and disparities. Of particular concern is the relatively slow growth of opportunities for girls to enter technical, scientific and professional fields of study, and thus be able to contribute to the national stock of high and middle-level skills. There is also a persistent disparity in the provision of educational facilities between rural and urban populations. Even in countries where relatively higher enrolment ratios have been achieved, the overall averages hide considerable variations which exist in the enrolment ratios in the rural and urban areas. In countries which have yet to achieve enrolment ratios at an adequate level, lack of educational provision in the rural sector verges on deprivation.

6. Wherever there are disparities, they tend to increase at each higher stage of the educational pyramid, being most pronounced at the top, in universities and other institutions of higher education. In most countries of the region, over 70 per cent of the enrolment at the tertiary level is accounted for by students from the urban sector. This not only indicates restricted access to education but also points to the fact that the selection mechanisms in the education systems tend to work in favour of particular social and occupational groups, and fail to draw reserves of talent and ability into the educational process on a wide scale.

7. Overall national averages of enrolments

fail to show another area of disparity which has been a matter of concern to national authorities - imbalance in educational development between different geographical areas or population groups within a country. Studies made in a few countries show that these "regional" disparities (that is, between different regions within a country) are found in correlation with other socio-economic indices of levels of living. These imbalances are recognized as serious obstacles to strengthening social cohesion and national integration. Many governments in the region have accordingly made the removal of these imbalances a cardinal principle of education policy.

8. One of the important findings of educational research points to the fact that equality of opportunities is not only a function of access to school. To achieve real democratization of education through the expansion of educational facilities, it is highly important to draw up a programme suited to the needs of the students and adapted to their environment. In particular, it has become evident that family and social environment variables of the pupils before they enter the school cause subsequent differences in learning rates. When the school programme does not take this situation into account, the learning potential remains unrealized.

9. Closely related to this issue is the existing gap between the expansion of educational facilities through the formal school system within an environment of adult illiteracy. In most countries of Asia the growth of adult literacy has been painfully slow compared to the growth of pupil numbers, with the result that the number of adult illiterates, in absolute terms, has actually increased. It is necessary to formulate, develop and apply national policies which, by methods appropriate to the circumstances and to national usage, will tend to promote equality of opportunity and treatment, having regard also to persons who have not received any primary education or who have not completed the entire primary education course. This will lead necessarily to the new concept of permanent or life-long education.

ADAPTING THE ROLE OF EDUCATION IN NATIONAL DEVELOPMENT

Manpower requirements and employment

10. One centre of concern in the Asian region is in regard to the balance between the skilled manpower requirements of national development and the quantity and quality of output from the education systems. There are varying situations in the countries but the studies that have been made show that the imbalance in one form or the other is noticeable in all. In some countries the supply of skilled personnel, notably at intermediate and higher levels, has fallen seriously short of the increasing demand of a developing economy. In other countries the problem of "educated unemployed" has become a major concern. The maladjustment between the education system and the realities and needs of the economy is further underlined by the fact that the countries which have the problem of "educated unemployed" also continue to have shortages in important categories and levels of skills. Many of the causes of "educated unemployed" have their origin in circumstances outside the direct influence of education systems; under-performance of the economy, rigidities in hiring practices, etc. Much of this unemployment is simply the conversion of disguised unemployment and underemployment into visible unemployment. There remain grounds, however, to indicate a basic imbalance between the education system and the economy if conditions of over-supply, and concurrently of acute shortages, become a persistent feature.

11. Another point of maladjustment is in relation to the sectors of national economy, notably agriculture and the intermediate sectors such as modern small industry and service enterprises. The technical breakthrough in agriculture (the "green revolution") has dramatically highlighted the need for and,the short supply of technical manpower in the agricultural sector. The farmers themselves must acquire skills of a higher order to cope with the new techniques involved in the "green revolution". The existing contribution of the education systems to increasing agricultural productivity and the training of skills required in agriculture and the intermediate sectors is out of line with the overall development needs.

12. Two issues emerge from the experience of the countries. Firstly, there is the need to make greater use than hitherto in educational planning of the tool of manpower estimating and forecasting. Admittedly, manpower forecasting is not a precise technique, especially in the developing countries where reliable and detailed data are scarce, but it can nevertheless provide useful indications about the broad directions in which the future development of education might be guided. This is especially so in regard to the enrolment policies in secondary and higher education, distribution of enrolments by types of education and the relative priorities to be accorded to institutional training and in-plant training.

Secondly, there is the need for mutual adjustment of both education and overall development strategies for the purpose of increasing employment opportunities. These employment opportunities do not consist only of salaried jobs; a much higher proportion comprises "self-employment opportunities". A person has, however, to be prepared in his attitudes and skills for a self-employment job as much as he has to be trained and qualified for a salaried job. This is where the content and methods of education become of vital importance. Basically, the imbalance between education and the world of work may lie in the fact that formal education has not been given a "work orientation". This orientation is unlikely to take place merely because a few "practical" courses are added to an academic curriculum. Rather, it has to be seen as an integration of work-experience and an awareness and knowledge of the world of work in the whole range of the content, methods and structure of education at all levels. It is to be conceived of as an essential element of education and, though not designed to be vocational, it should lay the foundations for giving to the education system as a whole a predominantly scientific, vocational and technological emphasis. Another essential element is the provision in the school system of guidance services and career information.

National and social cohesion

13. National development being more than economic growth, educational concerns are also much wider in scope. Some countries in Asia are multilingual and multinational. The rôle of the education systems in strengthening national and social cohesion is seen as vitally important. Where educational opportunities are unequally distributed or the education system is segmented into conflicting interests, education cannot operate as a cohesive influence. In a number of countries, therefore, a focal point of educational policy is the search for the unifying elements in education, for example, a common structural pattern of the education system, with schools which provide avenues of access to a common body of educational experiences.

14. Then, there is the question of education systems actively participating in, and serving the purpose of, national development. Promoting an awareness of the problems and issues of development is an obvious responsibility of an education system, but learning about development is at the most a second-best substitute for participating actively in it. Hence some countries of the region have experimented with programmes which provide opportunities for teachers and students to take part in works of national development. In some programmes a period of national social service is made compulsory at the secondary or post-secondary stages.

15. More than others, institutions of higher education and specialized institutions (technical/agriculture establishments, research organizations, etc.) have a notable contribution to make to bridging the gap that at present isolates education systems from urgent national concerns. Institutions of higher education in the developing countries represent the single most important concentration of highly-trained manpower, training capacity and research potential. They cannot, therefore, escape the expectation that they will provide leadership along a broad front of national effort, directing their research capabilities to problems which are of high priority in national development, training of personnel at the levels and in the form needed in the economy, and transmitting knowledge and skills into the daily life of the common people. Another highly significant area of involvement is the rôle of institutions of higher education in the qualitative improvement of school education. In spite of the fact that the quality of higher education is inseparably dependent on the quality of school education, institutions of higher education have, by and large, abstained from assuming responsibility for either studying the problems of school education or contributing to their solution.

16. There is a significant relationship between out-of-school education and the economic and social objectives of planning. The success of a development plan depends on the attitudes and competencies of the participants and these could be promoted and upgraded within a relatively short period of time through out-of-school education. Vocation-oriented courses for adult workers, particularly unemployed youth, could equip them for gainful employment or open up self-employment prospects. Out-of-school education could bring together on the forum of a common programme the diverse agencies concerned with national development - the planners, the public administration system, the universities and high-level institutions, the voluntary organizations and the participants in the development programme.

STRUCTURE AND BALANCE OF EDUCATION SYSTEMS

17. Expansion of education in the last two decades in Asia has altered in a fundamental way the composition of student population, bringing into schools pupils whose interests, abilities and environmental background represent a wide range of variation. As the projections presented in Appendix A show, pupil numbers will continue to grow in the coming decade and the diversification of student population will increase. Concurrently, the nature and variety of skills and knowledge needed in society are also changing at an accelerating pace as a result of socio-economic development. There is therefore a rising concern among national authorities over the fact that the system of education has not changed and diversified in line with the new profile of needs. Its structure and content as well as the pattern of institutional growth continue to be "single track". Originally the system was designed with limited purposes and catered to a small and highly selective proportion of the young population. It was primarily geared to producing university-trained manpower. The whole school system became oriented to the needs of the relatively few who continued to higher education. With rapidly increasing enrolments, the maladjustment between the structure of education and a new emerging context shows itself in the pressures building up all along the system, notably in admission to universities and academic secondary schools.

18. The structure of the system has to be so designed and adapted that it provides a diversified range of educational experiences and ensures that

pupils terminating at intermediate points are prepared for entry into the world of work, allowing them to re-enter the education system at suitable points to resume their formal education whenever needed. There are, it would appear, two key elements in such structural change. The first is to broaden the scope and purpose of the general education which provides the core of common learning experiences and forms the foundation for, and a continuing element in, all forms of subsequent education. Its purely "literacy"-centred focus has to be expanded to include science and, at an appropriate stage, pre-vocational and pre-technical education in order that general education may provide a broad range of experiences through which the pupils, and their teachers, may explore and test their abilities and aptitudes. The second key element in structural flexibility is the broadening and diversification of second-level education so that it may serve effectively the needs of the terminating students (thus linking the output to the economy's requirements of middle-level skills) and also of those whose abilities and attainment will carry them to higher education.

19. It has to be recognized that there is a large section of the student body whose abilities will find better expression in educational programmes which have a practical and occupational orientation than in the specialized courses offered in a university. This is also linked to the urgency of intermediate manpower needs in agriculture, technology, commerce, social services and education. The need appears to be for new types of post-secondary institutions which are flexible enough in their programmes to give full- as well as part-time education and to participate in in-service and on-the-job training.

20. In other terms, the notion of education systems may well need to be redefined in the light of the larger and more diversified enrolment of the new functions ascribed to education in the developing countries of Asia, of the need to co-ordinate and integrate all resources available for education in school and out of school, and of new educational concepts and experiments. Existing education systems in many countries of Asia are based on traditional structures of general education at the three levels, with provisions, often inadequate, for technical and vocational education and for out-of-school education. These education systems have grown in many cases through a process of successive additions. There is often not enough vertical continuity between various levels or stages of education or horizontal continuity between various types of education, either in school or out of school. Indeed, in certain cases, rigid barriers continue to exist between general and technical, and between school and out-of-school education. Easier passage from one type of education to another is necessary for the purpose of student orientation or to make re-entry into the education systems possible at various stages of life. There may be a need, therefore, for making education systems better integrated, more diversified and more comprehensive, on the one hand, and more flexible on the other.

21. In a number of countries a major problem in educational policy-making is presented by the fact that a sector of education, particularly at the second and third levels, consists of "private" schools. Arrangements for exercising governmental authority for regulating admissions, standards and functioning of private schools differ from country to country, as does the rigour with which the regulations are enforced. The "private" sector has helped in mobilizing resources into education from outside the public revenues and contributed notably to increasing enrolments. But, by and large, the enrolment increases have been in those types of education where there is already an unbalanced growth (arts and humanities). In the event, the influence of the private sector schools has tended to run contrary to the efforts of planning authorities to diversify the distribution of enrolment by fields of study and articulate it by levels of education.

OPERATING EFFICIENCY OF EDUCATION SYSTEMS

22. The efficiency of an education system may be considered, on the one hand, in terms of how well it fulfils its social and economic objectives (that is, by criteria that are external to the system), and, on the other hand, in terms of factors (quantitative and qualitative) that are "internal" to the system - who are educated, by what methods, in what knowledge and skills, with what results and at what cost.

23. As yet few scientific studies have been carried out in Asia to measure the performance of an education system in its multiple dimensions and relate it to the cost factor. This represents one of the most urgent tasks for educational research in the region. There are, however, a number of indications by which the internal operational efficiency can be judged.

One such indication is whether those who enter it at any stage stay to complete the cycle of education which, unless it is completed, does not equip them with the skills, knowledge and understanding for which that stage of education is designed. This is the problem of drop-outs, repeaters and examination failures. At another level of analysis it is also the problem of "under-achievement", that is the failure of the system to realize and develop the full potential of the educand. Closely related to this is another aspect of the problem whether the education system provides a nurturing ground for the development of talented and gifted pupils. The education system may be so narrowly based that it leaves the reserves of talent substantially untapped or so rigid that talent is not allowed to show for lack of freedom. Yet another facet of the problem is the failure of society to make effective use of the human resources that the education and training systems have developed and endowed with skills.

24. The review of educational growth in Asia presented earlier shows the alarming extent of wastage through drop-out that is still a persistent feature of educational performance at the primary level in many countries of the region. The cumulative effect of drop-out and repetition is to raise educational expenditure per primary school leaver by 2 to 4 times. The social cost is even higher. Because drop-out and repetition are more prevalent in rural than in urban areas, in the economically poorer sections of the population and among girls, the disparities in the distribution of educational opportunities are further sharpened, thus adding to social tensions.

25. At the stage of transition from the first level of education to the next higher level (lower secondary or secondary) a proportion of pupils who have completed elementary education terminate their schooling. Elementary education is not, however, an educational process that is complete in itself. The basic skills and habits it is designed to impart are only a preparation for a continuing use of these skills. Where opportunities for out-of-school continuing education are poorly developed and the formal school system itself makes no contribution to creating these opportunities, the skills of primary schooling lapse through disuse (particularly if the duration of the primary stage of education is itself a short span of four or five years) and the investment becomes to that extent unrewarding.

26. At the secondary stage, indicators of the performance of a system are different and more complex. A broad indication is provided by examination results in systems where the final or end-of-the-cycle examination is intended to certify success or failure in achieving certain norms or standards. This indicator has, however, to be interpreted with care, because examinations in their traditional form measure a very limited range of educational achievement. Most of the countries in the region - though not all - have this kind of examination system. The proportion of "successful" pupils varies in countries in the range of 45 to 60 per cent. A substantial proportion of pupils have, therefore, to repeat the grade and sit the examination again in the following year or drop out of school.

PROBLEMS OF EDUCATIONAL RESOURCES

27. The growth of education in the region has been impressive in the last two decades; but even more striking is the magnitude of expansion and change that is anticipated for the decades immediately ahead. To these trends are added the consequences of rising rates of population increase. All these factors to which must be added the demand for additional resources that any reform or reorganization of education must entail, combine to create an increasing strain on both financial and educational resources.

28. There is, however, widespread recognition that these conditions are precisely the ones that call for a fundamental appraisal and reorientation of the education systems. The greater the momentum of expansion in a system, the more difficult and costly any eventual modification of the system will be. The national policies, therefore, give priority to a qualitative transformation of the system in order that it may be better adapted to perform the increasingly diverse tasks that future growth will impose on it.

29. These considerations focus attention on four types of broad policy issues:

(a) Priorities in educational development. The question of priorities has to be viewed in the framework of overall national development plans with which plans of educational development have to be integrated.

Within education, the issues cover the efficiency and yield of the system and distribution of its benefits; priorities in the development of different levels and types of education; alternative choices in programmes and methods; scrutiny of traditionally assumed norms and standards in the management of education. Approaches to issues such as these must necessarily vary from one country to another; what is, however, of common concern is whether there is an adequate machinery backed up by a fund of required data and information, which will keep the issues of priority under continuous and informed review, anticipating changes and responsively readjusting the priorities.

(b) Alternative methods of financing education. In most countries of the region, public revenues are the principal source of educational finance and hence the growth of educational expenditure has meant an increasing budgetary strain. Public revenues will undoubtedly continue to be the basic support and education can reasonably claim its fair share in the increase that accrues to public funds from a higher level of economic growth to which education makes a not inconsiderable contribution. The strain is, however, there and will grow. The question therefore arises of alternative sources of support for education.

One source to which a few countries have given particular attention is the community contribution in labour and kind. The mobilization of resources from outside the monetized sector, particularly for adult education, primary education and the provision of school buildings, appears to be a highly promising prospect in the light of the experience of the countries where it has been tried.

Another source (and it is a variant of community support for education) consists of involving local and municipal bodies more closely in the financing of education with suitable safeguard for the maintenance of educational standards in institutions supported by them. Additional sources have been explored in some countries in the form of tied-in taxes or sucharge, and special taxes on enterprises which benefit directly from the training functions of educational institutions (e.g. technical education, applied research in the universities). It is clear that the sources of financial support have to be diversified in order that the burden on public revenues does not reach an unsustainable point.

(c) Improving resource utilization. Efficient utilization of available resources is yet another means of increasing educational revenues, since gains are made in the present level of outlay by improved methods of management.

The largest proportion of educational expenditure is on teachers. Since the teacher is also the single most decisive factor in improving quality of instruction, efficient use of teaching resources is of central importance. Questions such as these arise in this connexion: the proportion of teacher's time that has to be devoted to routine and clerical jobs which could as well be performed by assistants, leaving the teacher free for more teaching and pupil guidance; class sizes in the traditional school organization where classes in the lower grades are too large and in the upper grades too small; the relative cost-benefits of upgrading the qualifications of teachers through institutional training or in-service programmes.

Utilization of buildings and equipment is another area that calls for attention. It has been conclusively demonstrated, for example, that in the provision of science laboratories in schools, considerable savings can be made and instructional effectiveness enhanced by simpler and educationally meaningful laboratory equipment. The designing and construction of educational buildings leave ample room for imaginative application of techniques which make the buildings functionally more useful at less cost.

Another important area for improving operational efficiency is in the length of the school working year and day. Generally the duration of school time is not only inadequate but is interrupted by a large number of holidays, vacations and days off for various celebrations. The average size of school units, which tends to be small in most countries of the region, and the high repetition rates raise the unit cost by a margin which could be reduced substantially.

It is evident that improving operational efficiency does not lend itself to ad hoc "crash" economy measures. It has to be a part of a continuous programme of assessing the performance of the education system and involves development of budgetary procedures for educational institutions aimed at enhancing the discernment with which functions of resource allocations and use are performed at different levels of administration.

(d) Alternative methods for achieving educational goals. Scarcity of resources in relation to the magnitude of educational tasks brings about a growing recognition that traditional methods may no longer suffice. New means and techniques have to be evolved to achieve educational goals. In the developing countries, the problem is centred not so much on finding technological substitutes for traditional teaching manpower, but on enhancing the educational effectiveness of such manpower. Technological applications which contribute to individualizing instruction or increasing the effectiveness of the training component of education or giving wider spread to critically important teaching competencies that may be in short supply, are some promising lines requiring experimentation and empirical investigation.

Even more important from the point of view of resource constraints are the possibilities of devising or adopting different types of educational structures where the unit cost is less than that of the traditional type of educational institution. The search for these different types is specially relevant in secondary and higher education. Use of instruction by correspondence reinforced by mass media and some of the new techniques such as programmed instructional materials is an example of an alternative path for achieving educational objectives. The important point is not that these newer developments in "educational technology" have proved themselves but that a search has to be undertaken and a wide range of possibilities have to be empirically tested and applied, if solutions are to be found to some of the basic problems of educational development in the decades ahead.

QUALITY OF EDUCATION

30. In all recent national plans and policy pronouncements, no theme is expressed with so much urgency and concern as that of qualitative improvement of education. The Regional Conferences of Ministers of Education of Asian Member States (Tokyo, 1962; Bangkok, 1965) emphasized the overriding need to maintain and continuously improve the quality of education and accorded this aim the highest priority in planning for educational development.

31. Quality of education is not a single, unchanging and fixed concept. It covers what on analysis is found to be a multiplicity of processes, relationships and outcomes which interact and intermingle. For example, it is seen as a relationship between an education system and the society it serves, and is assessed in terms of the system's capacity to meet the needs of that society. Within an education system, the standards of quality have to be seen in terms of how far the pupils have been taken and what forms of knowledge, attitudes, skills and work habits have been developed. The knowledge that the schools seek to impart is a rapidly moving frontier, expanding at an unprecedented pace. The content of education, therefore, is no longer a fixed body of knowledge. Central to

educational concern are the skills in observing, analysing, communicating, testing, experimentation, discovery, learning to learn, and the capacity to learn and relearn throughout a working career.

32. The concern of national authorities about the quality of education is seen to cover both the external criteria of quality derived from the needs of the society and the criteria internal to the education systems based on educational objectives and standards of performance. There is a need to develop decision-making processes and machinery in order to formulate coherent policies which will give consistency to the changing economic, social, political and cultural goals, and which could serve as the basis for educational objectives at every point of the educational system and sustain innovative approaches to all the elements that form the system - planning and management, curriculum, instruction and instructional methods.

Chapter 4

PLANNING FOR REFORM AND DEVELOPMENT

1. The earlier planning efforts in the region were mainly centred on programming for the expansion of education within the constraints imposed by scarcity of financial and human resources. Integration with the overall national economic plans has been in terms of resource allocation and the question of manpower was seen primarily as the demand for, and supply of, certain categories of technical personnel.

2. Rapid expansion of the education system, increasing outlays of resources on education, the growing awareness of the crucial rôle of education in the modernization of society and of the gap between what is taught in the schools and what will be required by society in the coming decades, have led to the realization that the problem of educational development is dependent on a reorganization and reorientation of the objectives of education systems and of the nature of the training that they provide. Reform and development are connected inseparably. Clearly a stage has been reached where the need makes itself felt for national authorities to undertake a searching assessment of their system of education in its total range and re-examine its goals, structures, content and methods with a view to adapting it more effectively to the needs of national development.

3. The countries of the region are adopting varying approaches to the problem of educational reorganization. Some have examined the total education system and recommended far-reaching changes in structure, content, methods, institutional forms and the "pyramid" of education. Others have chosen to reorganize their systems through ad hoc reforms in particular sectors of education - higher education, vocational education, adult education and teacher training.

4. The experience of the countries which have carried out such "in-depth" study of their education system underlines three important considerations. Firstly, such examination should not be limited to the education system as it is viewed from within. It should also see education in its external socio-economic context. Secondly, it should cover education and training in all their manifestations in the formal as well as non-formal systems. Thirdly, it should look forward to the future, analysing not only the causes of the problems as they exist, but, even more important, taking account of long-range considerations in evolving alternative strategies.

5. No reform whether comprehensive or ad hoc, provides the final and definitive "blueprint". Measures of reorganization, however carefully conceived, are finally tested "on the ground" and the experience thus acquired is fed back into the process of policy-making in order to carry out the needed readjustments. A reform therefore has to carry over in some form of continuous or "rolling reform" which should build into the system the springs for self-correction and adjustment. Planning for educational development must accordingly comprise three major elements: a suitable machinery for linking policy-making with planning; a suitable strategy for implementing educational change; and an administrative and management system attuned to the environment of planned development

Machinery for educational policy and planning

6. The functions of educational planning machinery as they are found at present have to be widened and viewed in a much larger context. They have to be linked, on the one hand, with policy-making and, on the other hand, with educational programming. In educational policy a distinction must be made between two types of decisions which enter into policy-making: decisions by which the fundamental goals of education are defined, and "operational" or "technical" decisions by which these broad goals are translated into educational objectives, structures, and curricula. While undoubtedly these types of decisions interact, the rôle of educational planning is related more to the latter type. Seen in this light, educational planning should serve as an inquiry system which assists decision makers in defining objectives in operational terms, viewing them in the appropriate time perspective, evolving standards of attainment, assessing performance qualitatively and making choices between alternative developmental strategies, resource costs and different ways of achieving specified objectives. To serve these functions in decision-making effectively, it would be essential to develop adequate resources of information, data and techniques and have access to research findings and innovative experiments in education.

7. Considering that the problems in educational development are becoming increasingly complex, there is a need to develop a suitable organizational mechanism within a Ministry of Education which would link in a unified structure the three basic functions; namely, educational policy, planning, and programming. The mechanism,

(a) should be innovative in its approach and orientation;

(b) should cover in a unified manner the total range of education and training, bridging sectoral and departmental gulfs; and

(c) should be interdisciplinary in its personnel composition and methods.

8. The functions of such a mechanism might include the following:

(i) preparation of (and revising from time to time according to changing conditions) long-, medium- and short-term projections and forecasts of pupil flow and output;

(ii) collaborating with other appropriate organs in assessing manpower, employment and resource availabilities and formulating their implications for the education system;

(iii) Identification and analysis on a continuing basis of educational needs and problems and particularly the supply and demand of teachers and other educational resources;

(iv) analysing the implication for curriculum and training of relevant socio-economic developments and advances in scientific knowledge and technology;

(v) analysing and projecting the training capacity of the system, its output, level of capability and utilization;

(vi) collecting and analysing data on the socio-economic and academic characteristics of student population and its flow and distribution in the system;

(vii) carrying out diagnostic assessment, both qualitative and quantitative, of the education system and developing performance specifications and criteria;

(viii) analysing the costs and operational efficiency of the system to provide a basis for national policies regarding resource allocation; and

(ix) systematic examination of new discoveries and developments in educational practice and organization and promoting their introduction in the system.

IMPLEMENTING EDUCATIONAL REFORM AT INSTITUTIONAL LEVEL

9. The design of changes at the level of the total system has to be translated into action through programmes of qualitative development at the level of institutions, the classroom, the teachers and individual educands. A strategy of educational improvement and change is therefore concerned vitally with the question of how the rate of generating, diffusing and adopting improved practices throughout the system can be speeded up. A complex variety of factors determine an education system's responsiveness to change and readiness to adopt innovative methods, principal among them being the attitudes and qualification level of teachers, the existence of institutions with innovative practices, the degree of flexibility in the administration and management of education, and the total environment or value system within which education functions.

10. A noticeable feature of any education system is the striking range of variations in the quality of educational institutions and teachers. To bridge this gap the leading institutions and teachers could be drawn upon to induce a self-sustaining process of improvement in the rest of the system.

11. In systems where unqualified or poorly qualified teachers far out-number the leading teachers and where there is a large number of institutions shackled to outmoded practices, the impetus for qualitative change has also to come from outside the classroom in order to induce and support the growth points in the classrooms. An institutional base is therefore needed in order that loci of innovation and change are built into the system. The institutional structure has to provide for the three processes involved in qualitative development: creation or generation of new practices and their testing; demonstration and dissemination of new practices; and adoption of new practices on a system-wide scale. The education systems (unlike agriculture) have so far somehow failed to evolve an effective institutional base for diffusion of improved practices.

12. The links of such an institutional structure with educational research are obvious. Educational research is potentially one of the key elements in educational improvement. But it has also to be recognized that the orientation of educational research particularly in its traditional form, its long-term perspective and its methods, which are highly specific in design and approach, is not always compatible with the practical urgency which underlies developmental tasks in educational improvement. Furthermore, exposition of a theory, however well "researched", does not by itself ensure its application or ready adoption. In between lie two equally important phases, (i) development and testing, and (ii) the dissemination of the tested results. Each of these two phases has its own set of working techniques. Therefore the institutional structure for innovation and change has to have a different framework and orientation from that of educational research though it will necessarily draw upon research findings as well as upon the practical experiences of teachers and administrators for its developmental work.

13. In some countries of the region, experiments are in progress for developing "centres of excellence" in selected institutions of higher education which are designed to influence, by their methods and technical capability, the standards and quality of other higher institutions. A broadly similar approach, though in a modified form, may be considered for each level and type of education (primary, secondary, technical, teacher training etc.). This is seen as comprising two types of institutions. Firstly, there may be need for a series of experimental schools established and developed with the primary commitment to creating, adapting, trying out and evaluating new forms of organization, curricula, instructional methods and techniques. They will function in essence as developmental laboratories, translating research insights into practical application, systematizing the best

experiences of leading teachers and institutions and evaluating experimental programmes. By the very nature of the functions envisaged for the experimental schools, it is clearly desirable that they should be given a large measure of freedom from regulations which might inhibit them in carrying out their unique responsibilities. Secondly, the practices and forms of organization developed and tested in experimental schools would need to be demonstrated and disseminated on a wide scale. For this purpose, a network of demonstration schools is needed which would be chosen from existing schools of recognized merit and located so as to serve a cluster of institutions within a geographical area and a variety of educational environments in rural and urban sectors. They should also be given considerable freedom from routine administrative regulations. They will illustrate and demonstrate improved methods and techniques, specially those developed in the experimental schools and provide a forum for in-service education of teachers in the neighbourhood.

14. Another essential requirement of educational reform, both in the making of policy and its implementation, is wide-based public involvement and participation. Parental attitudes to, and assumptions about, education contribute appreciably to an education system's resistance to change. Where new structures and methods are being introduced in a system, they may confuse a concerned public unless the reasons are explained and understood. The experience of many countries in Asia has shown that where the community is actively involved in an educational enterprise, it has not only given material support but helped in creating an environment of acceptance which is so essential for sustaining an educational enterprise. The participation of youth (and not only of students) in the development of education has to be seen as part of the involvement of youth in transforming socio-economic conditions.

15. The active involvement and participation of teachers, through their organizations and in other ways, both in the generation and adoption of educational changes, are critically important. Teachers and their organizations should be recognized as a force which can contribute significantly to educational advance and which therefore should be associated with the determination of educational policies for reform as well as with the development of innovative practices in education.

16. An essential requirement of innovation is freedom to innovate. Therefore the rôle of policy-makers and administrators in promoting a climate of reform is a crucial one. While recognizing that a proportion of teachers would need to be prepared in new methods and practices by graduated stages, the administrator has to give active support to experimenting teachers and encourage them in their creative initiatives. Uniform prescriptions tend to cripple the work of those who wish to break new ground without necessarily helping those who prefer the security of known practices to the opportunity of modifying them.

EDUCATIONAL ADMINISTRATION AND MANAGEMENT

17. Intimately connected with the planning for educational reform and development is the capability of the administrative machine to respond to the increasingly complex demands made on it. For example, the impact of achievements in curriculum development or in the use of modern techniques depends on the "two-way conveyor belts" linking innovations and everyday operations and feedback. The distribution of new materials, the assignment and involvement of individual teachers all depend on factors such as the degree of flexible decentralization, the speed of transmission of decisions "upwards" and "downwards", smooth communication and constant adaptation to the new goals and objectives of education.

18. In the last decade or so, the machinery of educational administration in the countries of the region has had to deal with a variety of problems of growing complexity - educational expansion, scarcity of resources and new tasks created by development planning. That the machinery has been fully extended in the effort to deal with these problems is attested by the stresses and strains which it shows. By and large, the administrative structures tend to reflect either a highly centralized "maintenance-minded" system or one which is geared to respond automatically to expected demands. Thus, a highly congested Central Ministry, overly compartmentalized, often leads to abstract decision-making habits removed from field conditions and motivated by the needs of the administrative machine itself rather than what the actual field conditions require. "Feedback" from field operations to Ministry is weak; and thus, whether it be new constructions or teacher assignments and salary payments, decisions concerning them are more influenced by bureaucratic pressures than by the intrinsic requirements which have no channels of communications to the decision-maker.

19. Education is a highly disaggregative function running from central administrative headquarters to provincial and local administrative units and to institutions which vary in their size from several thousand students in some university departments, to a dozen children in a one-room rural primary school house. Thus, the organization and functions of such a complex network ought to call for highly sophisticated techniques. This is particularly necessary in the context of the scarcity of resources in the region's developing countries. For example, recurring expenditures on salaries - which account for the largest proportion of total educational expenditure - would be more economically used if class sizes, assignment of teachers, and curriculum reforms were programmed

rationally, thus bringing about greater returns for present outlay. In capital outlay, administrative decisions governing, say, the choice of school sites, the quality and technical coefficients for construction of new buildings or for the purchase or manufacture of furniture and equipment have to be based on optimum choice, based in turn on economies of scale or adequate timing of operation.

20. The so-called "modern techniques" used in systems analysis such as PERT are simple instruments calling for an intellectual discipline rather than for highly specialized skills and complicated information "inputs". Their use in everyday administration would ensure optimization of resources. Slightly more developed techniques (PPBS, graphs, etc.) would also facilitate the decision-making process.

21. No solutions are universal, but a frank assessment of the inadequacies of the system would help clear the air and should gradually lead first to a redefinition of the objectives of the administrative machinery and then to a new configuration of its components so they may be designed to meet these objectives. This, in turn, should help reassign tasks to a new "breed" of specialists: the managers of education who should be trained in the use of modern techniques routinely used in most other sectors of the national life. Proper studies could also point up the justifications for introducing new computing equipment which, whilst apparently costly, might reduce other expenditures.

22. While there are various administrative organizations in the countries and different traditions within which they have evolved, there are none the less certain common directions in which examination of educational administrative structures by the national authorities concerned would help in enhancing the capability of the organization to achieve educational goals and better utilization of resources. No single organizational reform can provide the solution to all the problems; the effort will necessarily have to be multidimensional to cover the following aspects:

(a) Legislative and procedural measures to coordinate the functioning of numerous national agencies which are concerned with national education.

(b) Appropriate mechanism to provide technical support to educational policy, planning and programming.

(c) Structural reorganization, largely on the basis of management objectives, in order to achieve clear definition of responsibilities and functions and closer articulation among different operational units.

(d) Structural balance, through a strengthening of provincial/regional and district level operational units, and through decentralizing and the granting of greater responsibility and authority to them with provision for appropriate control and monitoring systems.

(e) Procedural reforms in order to simplify, and make more functional, administrative and financial procedures and to organize a suitable machinery for systematic evaluation of programmes in operation.

23. The next decade will impose many new tasks on the administrative machinery for education. The time to reorganize is before these tasks begin to unfold so that the administration is in a position to respond to them imaginatively. A searching scrutiny of the administrative organization in all its aspects should be the first preparatory step in moving towards new goals in education. In this connexion, two measures may be considered:

(i) First is to establish at the national level a high-power committee or commission to undertake an overall examination of the administrative machinery and formulate recommendations for its reorganization. Some countries have carried out such appraisal in regard to general administration. The national body charged with this responsibility should also include persons from local education authorities and from outside education who have special knowledge and experience in fields such as public administration, business organization and industry.

(ii) In the Ministry of Education, and located at a point nearest decision-making level, a unit should be established for organization and methods. It would carry out analytic studies in organization and methods in different segments of the administrative machinery and make recommendations to the Minister from time to time.

24. Personnel development: first priority: Better organization and methods of work do not provide all the answers: these are essential aids but they depend on the quality and skills of the persons who man the organization. An organization renews itself through the people who man it. In educational administration, as in many other sectors of education, there is an imperative need to recognize that there should not be a single door through which alone people can come into the organization. The administrative functions in education are becoming more and more diversified and call for a wider range of competencies and skills. The manning of the educational administrative organization has therefore to represent the diversity of skills needed for its management tasks.

While the need for diversified skills in educational management is recognized, the special nature of educational administration should also be kept in view. In educational administration, management skills and educational experience interlock at every point. A manager who has no insight in education is likely to prove a poor manager of education however skilled he may otherwise be in terms of his management skills. A general skill or technique has therefore to be particularized for education: thus planning becomes educational planning, statistics become educational statistics, and administration becomes educational administration.

25. Personnel recruitment policies have to be directed to these twofold aims: to draw into

education a variety of skills and knowledge, adapting them to the specific nature of educational tasks; and to prepare people with educational experience and insight to assume administrative rôles.

In spite of the recognition that educational administrators need to be trained both by pre-service and in-service programmes, the actual training facilities in the region are very meagrely developed. In sharp contrast to the continuing neglect of the training of educational administrators is the rapid development of training facilities for senior civil servants. In a number of countries, institutions for public administration have been established and the training of civil servants is undertaken on a systematic basis.

The training plan for educational administrators will have to cover all forms of training induction courses for fresh entrants, in-service training, on-the-job training, training of high executives, and courses for lower levels of educational administration. The content of such courses should represent a careful balance of theoretical knowledge, both of education and administration, intensive training in management tools, and practical work. The overall purpose of training should not be limited to a description of educational administration as it is found in the country but should enable the trainee to analyse the existing structure in relation to the needs of development administration. The trainee should therefore be introduced to the new techniques that have emerged in general administration, and see their applicability to educational administration: techniques such as cost-benefits analysis in financial administration, or network analysis and systems analysis in management science.

26. Management science has made rapid advances in recent years and management techniques of great power have been evolved. There is need for creative research to assess the applicability of these techniques to the administration of education and to adapt them to the conditions and requirements of developing countries. Since research and development in this important sphere may not be feasible in all countries, a regional mechanism could usefully undertake this work, along with the training of national personnel in the new techniques of management.

Chapter 5

PLANNING FOR BETTER LEARNING

CURRICULUM DEVELOPMENT - REFORM OF THE CONTENT

1. Curriculum-making in Asia by and large follows the traditional pattern. Ad hoc committees of teachers and other specialists are formed which decide what subjects are to be taught in a grade and the allocation of instructional time. Syllabuses and courses of study are then developed which set forth itemized lists of the topics and sub-topics in each subject. Thereafter textbooks are prepared - by a State agency or private publishers - to conform to the syllabuses and courses of study. In recent years, however, new developments, notably in science curricula, are taking place in many countries of Asia. These represent an innovative approach to curriculum development.

2. One of the most significant developments of recent decades has arisen from the insight that curriculum-making involves processes which affect every aspect of educational practice. The selection of a subject to be taught involves, among other things, analysis of the nature of that subject, definition of the objectives for which it is taught, understanding of the capacity and "readiness" of the pupil, the methods of teaching appropriate to the nature of the subject and the capacity of the learner, the learning aids and materials relevant to these methods, and assessment of what the teaching and learning may have accomplished. Curriculum-making therefore has a much wider and more dynamic function. It is concerned with processes by which all the learning is planned and guided in an education system or in a school or a classroom. The selection of subjects and their organization into courses of study or syllabuses are only a part of this larger process.

3. The rapid increase in the amount and complexity of knowledge is the outstanding feature of modern times. New disciplines of study have emerged and the boundaries of established disciplines can no longer be sharply defined. These developments have profound implications for the curriculum as the principal medium for translating knowledge into learning. It will no longer suffice to try to keep pace with the advancement of knowledge by merely adding new subjects or topics to the syllabuses. Learning can no longer be equated with learning of facts, for facts are becoming too numerous. In curriculum-making, therefore, fundamental attention is given to scrutiny of the basic concepts and methods of inquiry of a discipline in order to select those which will provoke and generate other ideas and concepts.

4. The second source of change compelling new approaches to the curriculum is the learner. One of the important tasks in curriculum-making in Asia is to adjust the content and methods of education to the widening range and variety of ability and aptitude that the student body now represents. Another set of changes is induced by steady advances in the psychological understanding of the nature of learning, of the conditions in which learning takes place, and of individual differences among the learners. While a definitive body of knowledge still lies in the future, the insights that have so far been gained add new perspectives to curriculum-making.

5. The third focus of the curriculum is provided by influences which have their origin in the society. Both economic and social needs are mediated through the curriculum, and curriculum-making has to be sensitive to the responsibility of the schools to educate the individual in understanding social change. There is another aspect which is now assuming increasing importance. It goes beyond the question of educating for social adjustment and is concerned more with presenting social issues and problems to the learner and helping him in bringing to bear on these issues the attitudes of an inquiring mind which it is the purpose of education to cultivate. Issues of race relationship, poverty, deprivation, international co-operation, etc., create a climate of demand for more attention to be given to the kind of social problems with which the pupils have to live when they step out of the four walls of the classroom.

6. The curriculum - interpreted in this comprehensive sense - has a special rôle in educational development policies. It is a means by which the quality of instruction is continuously upgraded. Initially adjusted to the level of teaching capabilities which may be available in the system, the curriculum has the effect of raising the level of learner and teacher capability, thus making it possible for the knowledge-content to be presented at a higher level of adjustment. Both learner and teacher capacity is extended by what the curriculum provides for them. In this sense, the curriculum process is appropriately described as curriculum development. Given the developmental approach to the curriculum, the interaction between the expanding world of knowledge and the education system is a spiralling movement towards continuous improvement and growth.

7. Certain basic considerations with reference to curriculum decisions which call for examination in the Asian countries are identified in the following propositions.

(a) A sound programme of general education should be the basic foundation of education, designed to foster a spirit of inquiry and of adaptability to changing environment. It should be continued over an adequate period of time in order to ensure that the methods of thinking and working and means of expression are developed to a degree that will help the educands in understanding their environment and the problems of social and personal living.

(b) A balanced programme of general education should include at all stages four essential and interdependent components of the curriculum: the humanistic element; the scientific element; education in moral values; and practical activities and pre-vocational work experiences to develop practical skills and work habits and to encourage participation in the productive life of the community.

(c) The programme of general education should provide a common body of educational experiences which is essential for all pupils, and also opportunities for the discovery and development of individual talent in order that pupils may be guided in their choice of future studies and careers.

(d) The educational programmes should be diversified at an appropriate stage of school education, so that they are adapted to the varying aptitudes and abilities of the educands as well as to the different levels of their attainment. The needs of scientific, technical and vocational education should be given prominent attention.

(e) Provision should be made in the curriculum programmes for those whose abilities call for a faster pace of learning and study in greater depth.

8. Also implied in the above propositions are certain issues which are specific to some countries in the region. These include, for example, the rôle of language teaching as a unifying factor in multilingual countries; the harmonization of technical/scientific subjects in general education; and the relation between technical education and out-of-school technical training.

9. Curriculum development and examinations or evaluation should be closely linked as interdependent functions. In all countries examinations are, in one form or another, an important factor in education; in the countries of the region, they dominate the educational process. Teachers tend to teach what the examinations are believed to be looking for and students tend to learn just as much as the examinations require. Precisely because examinations are so pervasive in the influence they exercise, they are also potentially a powerful spearhead for curriculum reform and qualitative change in education.

10. That examinations are needed in some form or another is attested by the experience of all education systems, however diverse their other characteristics might be. They provide a goal, and a stimulus to achieve it: properly used, they can be a powerful aid to curriculum development. The problem is how, for what purpose, and by what means examinations are to be controlled and guided. One aspect of the problem is the relative rôles of internal and external forms of examination.

11. External control of an examination has its origin in the concern to ensure equivalence of standards and a high degree of objectivity in the assessment of pupil achievements, the results of which are to determine their future careers. While external examinations at the lower levels of school education have had little to commend them and are in any case becoming increasingly difficult to administer under the pressure of growing pupil numbers, the secondary education examinations have a rôle from which considerations of equivalence of standards and objectivity in assessment cannot be excluded for quite some time. The question, therefore, is how these external examinations can be reformed so that they contribute to improvement in teaching and learning.

12. The measures that are needed to bring about a fundamental reorientation of examinations (covering both internal and external) seem to fall into the following main categories. First, there should be close congruence between examinations and curriculum objectives. Second, examinations viewed as an integral part of the educational process should be capable of assessing a wider range of educational outcomes in order to serve the purposes that are appropriate to different levels of education and the varying needs of pupils, the difficulties being encountered by pupils, orientation of pupils for making educational choices, assessing achievement of various curriculum objectives, and assessing aptitudes for selection purposes.

13. One reason why reform of examinations has not made as much progress in the region as the urgency of the problem calls for may be the absence of any institutional support for developing, testing and refining evaluative instruments. In most countries, the agencies which are responsible for conducting external examinations have few links with other aspects of curriculum development and cannot therefore derive from them a stimulus for re-examining the methods in use.

14. The second important need is for training of personnel. In externally conducted examinations, training in appropriate form will be required for those who design examination questions as well as the examiners. Equally important is the training of teachers in evaluation techniques. It should be remembered that even in education systems which are dominated by external examinations, the largest number of examinations remain internal and are administered by teachers.

15. Unlike many other reforms, fundamental changes in examination procedures require a longer lead-time of preparation. There has to be a close integration of effort between those responsible for making policies for the school system and those who determine admission policies and selection procedures for the universities and institutions of higher education. Furthermore, parents, students, teachers and the community are also vitally interested parties and should participate in the preparations that lead to changes in examination.

16. The current practices in curriculum-making in the countries of the region generally stem from an approach which involves equating the curriculum with a series of subjects which are then broken down in the syllabuses into topics to be taught. In recent years, however, with an increasing concern for qualitative improvement of education and the recognition that overall educational development must be seen in the context of the "what" and "how" of education, a few countries are moving towards a more comprehensive view of the curriculum and establishing suitable administrative mechanisms for the purpose.

17. In the light of the strategic place of curriculum development, due attention should be given to devising for it an adequate mechanism within the administrative structure of an education system. This mechanism for Curriculum design and development should be responsible for:

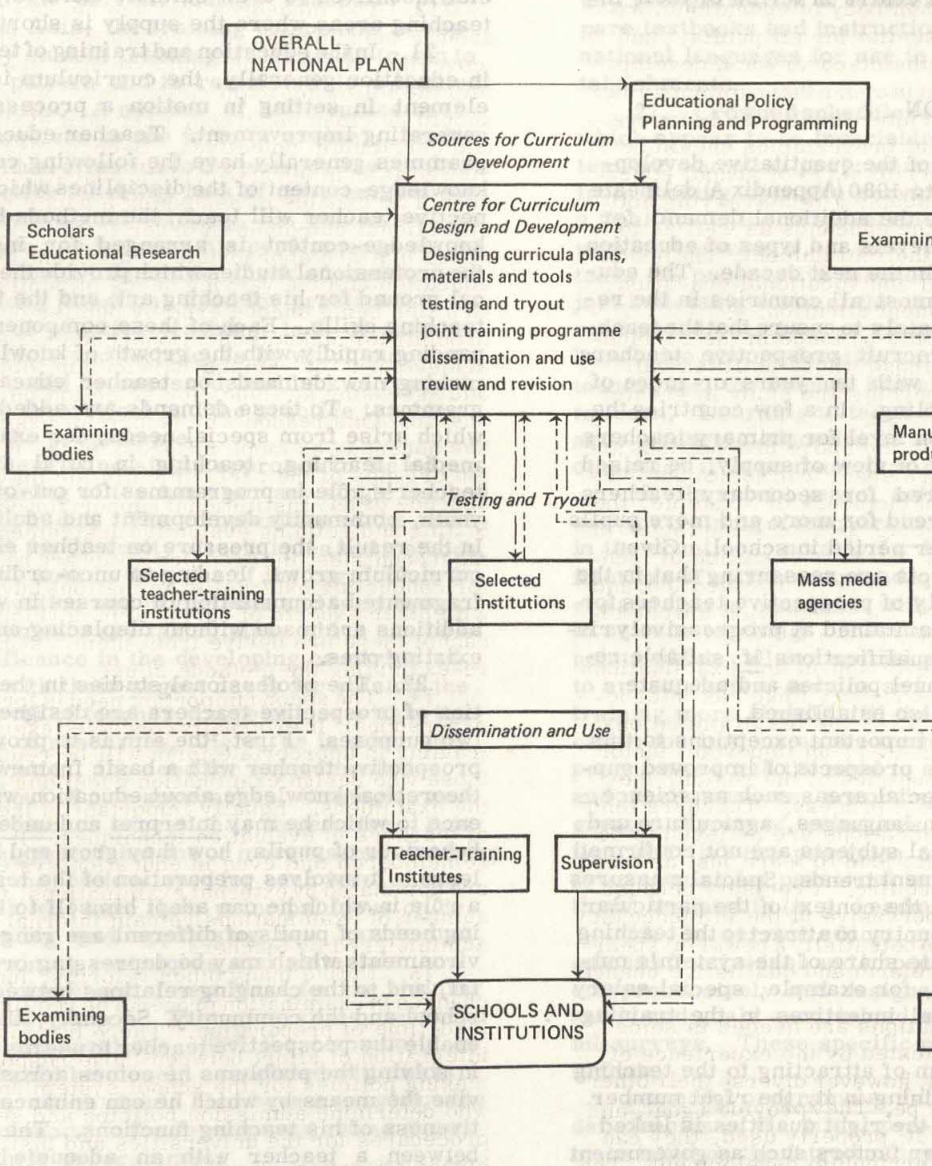
(a) designing and developing curriculum plans, instructional materials, and evaluation tools;

(b) testing and trying them out (for example in the experimental schools);

(c) disseminating them for wide-scale use;

(d) organizing in collaboration with other institutions special training opportunities for

CENTRE FOR CURRICULUM DESIGN AND DEVELOPMENT, INPUT-OUTPUT CHART


OVERALL NATIONAL PLAN
Educational Policy Planning and Programming
Sources for Curriculum Development
Centre for Curriculum Design and Development
Designing curricula plans, materials and tools
testing and tryout
joint training programme
dissemination and use
review and revision
Scholars Educational Research
Examining Bodies
Examining bodies
Manufacturing/ production units
Testing and Tryout
Selected teacher-training institutions
Selected institutions
Mass media agencies
Dissemination and Use
Teacher-Training Institutes
Supervision
Examining bodies
SCHOOLS AND INSTITUTIONS
Mass media agencies
KEY
Input into the Centre
Output of tested curricula for implementation
Output of curricula for testing and tryout
Feedback to the Centre

educational personnel involved in curriculum development, notably teachers and supervisors; and

(e) reviewing and revising curriculum plans from time to time.

18. There are specially important links that a national centre for curriculum design and development must maintain:

(a) with universities and the community of scholars;

(b) with educational research;

(c) with the body responsible for conducting examinations;

(d) with the schools and teachers who are trying out new curriculum and teaching practices; and

(e) with similar institutions in other countries.

The chart on page 47 sketches broadly the envisaged activities of a centre in terms of their input and output phases.

TEACHER EDUCATION

19. Projections of the quantitative development of education up to 1980 (Appendix A) delineate by order of magnitude the additional demand for teachers at different levels and types of education that is likely to arise in the next decade. The education systems in almost all countries in the region have grown adequately to ensure that the teaching profession can recruit prospective teachers for primary schools with ten years or more of minimum basic schooling. In a few countries the minimum qualification level for primary teachers could, from the point of view of supply, be raised to equal that required for secondary teachers. There is a marked trend for more and more pupils to stay on for a longer period in school. Given this trend the prospects are reassuring that in the next decade the supply of prospective teachers for the schools can be maintained at progressively rising levels of basic qualifications if suitable recruitment and personnel policies and adequate training places are also established.

There are some important exceptions to this general picture. The prospects of improved supply of teachers in special areas such as science, mathematics, foreign languages, agriculture and practical and technical subjects are not confirmed by the present enrolment trends. Special measures have to be devised in the context of the particular conditions in each country to attract to the teaching profession an adequate share of the system's output in these subjects, for example, special salary schedules, or special incentives in the training establishments.

20. The problem of attracting to the teaching profession, and retaining in it, the right number of candidates having the right qualities is linked with a variety of other factors such as government recruitment and promotion policies, teachers' salaries relative to other salaries, methods of training, promotion prospects and the social recognition accorded to the teaching profession. In most countries in Asia, teachers' salaries are relatively low and a progressive increase is, therefore, assumed in any forecast of future teacher supply. It has also to be assumed that a part of the increase is related to increase in the level of teacher qualifications. The points of special importance in reviewing recruitment policies, salary-schedules and salary-structure at the national level are, first, whether they facilitate mobility of teachers of merit and having the required qualification from one level or type of education to another; second, whether they have built-in elements (for example, merit promotion, etc.) to attract a fair proportion of the higher ability group to the teaching profession; and, third, whether they have special incentives to draw suitable candidates into teaching areas where the supply is short.

21. In the education and training of teachers, as in education generally, the curriculum is a key element in setting in motion a process of self-generating improvement. Teacher education programmes generally have the following components: knowledge-content of the disciplines which the prospective teacher will teach; the methods by which knowledge-content is arranged for instruction; the professional studies which provide the theoretical ground for his teaching art; and the training in teaching skills. Each of these components is expanding rapidly with the growth of knowledge and making new demands on teacher education programmes. To these demands are added others which arise from special needs, for example, remedial teaching, teaching in rural areas, the teacher's rôle in programmes for out-of-school youth, community development and adult literacy. In the result, the pressure on teacher education curriculum grows, leading to unco-ordinated and fragmented accumulation of courses in which new additions are made without displacing any of the existing ones.

22. The professional studies in the preparation of prospective teachers are designed to serve two purposes. First, the aim is to provide the prospective teacher with a basic framework of theoretical knowledge about education with reference to which he may interpret and understand the behaviour of pupils, how they grow and how they learn. It involves preparation of the teacher for a rôle in which he can adapt himself to the varying needs of pupils of different age ranges, to environments which may be depressing or congenial, and to the changing relations between the school and the community. Secondly, the aim is to enable the prospective teacher to use his knowledge in solving the problems he comes across, or devise the means by which he can enhance the effectiveness of his teaching functions. The distinction between a teacher with an adequate theoretical preparation and one who does not have that grounding lies in the higher degree of flexibility with which the former can approach a variety of new teaching

situations, as compared to the latter's heavy dependence on teaching in the way he himself was taught.

23. Another component of a teacher education programme is training in the skills of teaching. Teaching is not a single process; it calls for a wide variety of skills and the use of different types of techniques and media: intellectual, emotional, social and material. On the one hand, the teacher handles such materials as books, chalkboard or educational television, and on the other, he handles intellectual concepts and interacts with pupils at crucial points in their lives. The training of skills in a teacher education programme therefore calls for a corresponding diversity of training techniques.

24. In the current teacher education programmes in Asia, the training component is represented by student teaching which tends to run to a uniform pattern and is restricted to a limited range of skills. A number of deficiencies have shown themselves in one form or another: inadequate individual attention to the prospective teacher during practice teaching; lack of opportunities for him to analyse actual teaching, his own as well as that of others, or improve his performance on the basis of feedback information; lack of variety both in the teaching situations used for practice and the techniques of practice teaching; lack of suitable evaluation tools and techniques by which outcomes of training could be assessed; and lack of rapport between the theoretical and the practice teaching aspects of the programme.

25. There is no single approach to the education and training of teachers nor any single method for carrying it out. The complexities of the teaching task call for diversity of techniques and methods. Fortunately, both in the area of the curriculum in teacher education and in methods and techniques, new developments are taking place which can be of great significance in the developing countries of the region with their urgent needs for raising the effective level of teacher competencies within the constraints of resources. Here, as in other sectors of education, the need for experimentation and testing out of new approaches, strategies and methods in teacher education is imperative. It is therefore suggested that one or more teacher-training institutions may be developed for each level of education which will have their principal focus on devising, testing and appraising new curriculum models, training techniques and materials and serve as a laboratory of new ideas for the training system in the country. The universities, teachers and their organizations, and the community of scholars should be closely associated with these institutions, which should also have a considerable degree of autonomy in the development and administration of their programmes.

26. An important problem in most countries in Asia arises from a lack of suitable textbooks and other instructional materials in the national languages for use in teacher education programmes. Many subject areas covered in teacher education programmes need to be related to national or local conditions in order to be valid or relevant, for example, psychological growth of children, educational sociology, problems of education and educational administration. The books have also to be adapted to the level of academic preparation with which the prospective teachers enter teacher-training establishments. Books prepared in other countries and for different conditions, though invaluable for reference and comparative study, cannot adequately serve the teaching needs in training institutions. It therefore appears urgently necessary that measures be taken, as an integral part of the process of curriculum reform and reorganization in teacher education, to prepare textbooks and instructional materials in the national languages for use in teacher-training establishments.

27. Crowded schedules and "hurry to survive", which appear to be invariable characteristics of teacher education programmes, generally result from looking upon pre-service teacher training as a final act in the preparation of teachers. Pre-service training is, in fact, only a beginning; it takes the prospective teacher to the starting point, just indicating a few of the directions along the road ahead. As long as education is needed and knowledge about education and children continues to increase, the teacher has always something new to learn. Learning to teach is a life-long pursuit and a teacher's education is a continuing education; otherwise it is no more than certification.

28. In recent years, activities for the in-service training of teachers have grown considerably in the countries, notably for improving the qualifications of untrained or inadequately trained teachers and also in connexion with the new programmes in science teaching. There are, however, some points which call for special attention: (i) the need to articulate pre-service and in-service forms of training more closely; (ii) the use of teacher education institutions as the main base for in-service programmes and the need to strengthen their staff and other resources accordingly; (iii) the use of a greater variety of techniques for in-service education; and (iv) the provision of special in-service programmes for personnel in key places of instructional leadership (e. g. headmasters, etc.).

29. In-service education programmes would gain in effectiveness and impact if they were planned comprehensively and designed to service specific needs and goals ascertained on the basis of careful surveys. These specific needs and goals would include:

remedial programmes intended to correct the deficiencies of the initial pre-service preparation or to build on the introductory experiences given in pre-service preparation;

upgrading programmes intended to keep the teachers abreast of new advances in knowledge;

programmes for special needs intended to provide training opportunities which are designed for the special needs not covered adequately in pre-service programmes, for example, education in rural areas, or slums in city areas, education of tribal population, etc.;

curriculum development programmes intended to train teachers to handle new curricula and methods or acquire skills and pedagogical knowledge required for new teaching rôles; and

instructional leadership programmes designed specially for those who will fill positions intended to provide guidance and leadership, for example, master teachers (who supervise practice teaching of teachers under training or guide beginning teachers), headmasters and supervisors.

30. The sharp cleavage between pre-service education and what happens after is marked out in the way that a prospective teacher on completion of training is left almost without guidance to find his feet in the new teaching task. The first year of service of a new teacher should be treated as a continuation of his training, with guidance and supervision provided by the school and a teacher education institution. The deficiencies and faults that come to light could then be appropriately treated through a remedial type of in-service programme. Teacher education institutions should be the principal base for planning and designing in-service programmes, carrying them out themselves or through other centres and schools. Assumption of responsibility for in-service education implies that the teacher education institutions will not only organize and conduct courses but be actively associated with the schools in their area, providing them with professional advice and services. This proposed widening of the traditional scope of a teacher education institution's functions will not only be important for the schools but will also vitalize teacher education programmes by infusing in them a constant awareness of the actual needs and problems of the schools.

31. Only a few countries in the region have special in-service training programmes for key personnel in the instructional system. These key places would include heads of schools, heads of departments and supervisors (general supervisors as well as subject specialists). The responsibilities of these personnel are not only managerial but also instructional, and it is their leadership rôle in instruction that needs to be recognized in in-service programmes specially designed to develop the knowledge and skills called for in this rôle.

32. With the large number of teachers who have to be trained or retrained, the use of new methods and techniques can be critically importtant in increasing the training capacity and effectiveness of teacher education institutions. The number of teacher education institutions being relatively small in relation to the number of trainees served by them, the cost-benefit ratio would entirely justify equipping teacher education institutions adequately and training their personnel in the extensive use of new methods and techniques. There is a wide scope for the use of new methods and techniques in the training of teachers, including in-service training, and it is here that a break-through can be achieved in dealing with the problem of rising demand for trained teachers and the need for qualitative improvement of teacher education. In this connexion, attention is drawn specially to methods and techniques such as correspondence education, broadcast media, programmed instruction, language laboratories, team teaching and auto-instructional devices.

33. As pointed out earlier, one of the basic weaknesses in teacher education programmes lies in the training of prospective teachers in the skills of teaching. New developments in training techniques have brought within sight the means for increasing the effectiveness of skills-training, notably techniques such as micro-teaching and simulation, and aids such as 8 mm. film and videotape. The use of these devices is not to the exclusion of other aids which can, and should, be made by teachers from locally available materials.

Introduction and use of new techniques may involve two stages. In the first stage, the various techniques should be tested for the different training and educational purposes served in teacher education programmes. Personnel from teacher-training institutions will also be thoroughly trained in the use of the techniques, and, in case of equipment-based methods, in the operation and maintenance of equipment. This phase of testing, adaptation, preparation of protocol materials and training should be located in the selected experimental teacher-training institutions recommended earlier. On completion of this phase, the use of new techniques could be extended to all teacher education institutions in the second phase.

34. In a number of countries, faculties or schools of education have been established by the universities which also provide post-graduate programmes in education. High priority should be given to strengthening these programmes, and where they do not yet exist, to establishing them.

35. The post-graduate programmes in education should be so designed, in terms of their orientation, content and duration, that they meet the different needs that exist. Broadly these needs comprise: (i) teacher educators for teacher education institutions; (ii) specialists in the area of educational planning, educational administration and educational management; (iii) specialists in the area of instruction, for example, curriculum, guidance, supervision and teacher; and (iv) research workers. Post-graduate programmes in education would gain in relevance to the needs of the country if the designing of these programmes were preceded by a careful analysis of the requirements of the education system and the kind of competencies that would be relevant to it. Specialization in a narrow field is likely to prove inappropriate; and

the attempt to replicate, at a higher level, the range of studies offered in the first degree may lead to superficiality. A balance between narrow specialization and wide-ranging accumulation of courses is called for, and this is more likely to be achieved if the needs of the education system are kept in view, rather than by following the established practices of other disciplines or models.

36. In many countries in the region, the control and policy direction of teacher education is vested in different bodies. Teacher education institutions may be government institutions or "private" managed institutions or university institutions. Then, there is the distance that separates teacher-training institutions for primary schools from those that prepare teachers for secondary schools. In a few countries there are separate teacher-training institutions for junior high or middle grades. In terms of management and control, teacher-training institutions for academic education generally function quite separately from teacher-training institutions for vocational/technical/agriculture types of education.

37. While diversity in the management and control is in some circumstances inevitable and even desirable, there is a need to examine at the national level whether adequate mechanisms exist by which unified policies and plans for the supply and training of teachers are evolved and norms and standards for teacher education are developed. Since in rapidly developing education systems, new needs and problems are constantly emerging, it is also desirable that these norms and standards be periodically reviewed.

38. Another important need is to associate the universities more closely with the education and training of teachers. There are only a few countries in the region where the universities have taken an active rôle in teacher education, particularly at the primary level, and in consequence primary teacher-training institutions have been isolated, to their detriment, from the academic community.

Primary teacher-training institutions find themselves isolated not only from the university community but also, in many countries, from institutions which prepare teachers for secondary schools. Institutions for the two types of training are separate, with few links between them, and, in many instances, the salaries of teacher educators are markedly dissimilar, thus preventing movement of trainer staff from one type of institution to another.

39. It is, however, recognized that in many countries, because of the disproportion in the numbers involved at the first and second levels of education, teachers for primary schools cannot all be prepared in training institutions for second-level teachers. A beginning towards a comprehensive type of teacher education institution can nevertheless be made by providing unified salary-structures for teacher educators to induce greater exchange of staff, by mutual sharing of facilities and teaching resources and by developing a few selected secondary teacher-training institutions to offer teacher education programmes for primary as well as secondary teachers.

NEW METHODS AND TECHNIQUES IN EDUCATION

40. New methods and techniques in education range all the way from the use of simple audio-visual aids or new classroom techniques such as the non-graded school to sophisticated techniques based on a variety of equipment and material. "Educational technology" is not necessarily to be equated with the use of expensive and sophisticated equipment. Basically it is a process to systematize the application of scientific methods to the organization of equipment and material in order to optimize learning.

41. The high cost of equipment-based educational technology as it is being developed in other countries may place severe limitations on its utilization in the developing countries of Asia. The need for testing some of these technologies and adapting them to the conditions in Asia is recognized, however, because there is reason to believe that these new techniques may make it possible to change the quantitative or qualitative output of the school systems and may even lead to the development of new educational structures.

42. Educational technology is the effort to combine technology with new attitudes and outlooks so that the learning process may be accelerated, qualitatively and quantitatively, in new forms of education systems. New concepts designed to bring about a more efficient use of time, resources and teaching personnel are leading to a thorough critical examination of traditional educational models. As a consequence, educators are trying to answer certain basic questions as they seek to determine which new methods and materials will be most efficient. For example, given present technological progress, most notably in communication, how can the results currently obtained in school systems be increased, especially with regard to the improvement of the learning process, memorization, and the transfer of knowledge? What patterns of human means and materials will allow better and faster instruction to be provided for more students? In those cases where positive results have been noted, can these results be generalized within the body of instructional activities and applied in particular to the developing countries? What are the strategies which would permit the introduction of these new technological contributions into the existing education systems, given the technical difficulties and the human reluctance which they will also encounter?

43. The introduction of educational technology into schools and institutions, like any teaching

innovation, cannot be considered as an isolated phenomenon. Rather, it is imperative that there be full collaboration and co-operation among educational authorities, including teachers and their organizations, teacher-trainers and the producers of teaching material. This global approach has now been made possible by the application of analytical techniques such as operational research and systems analysis to make a critical examination of existing education systems and to suggest how new teaching patterns based on scientific principles, where technological resources will find their place, can be applied to the educational process and yield more efficient results.

44. The use of educational technology will not replace the teacher; rather, it will increase his availability and make him more accessible to the individual problems of his students. It will free him from certain strictly mechanical tasks of presentation and repetition in order to allow him to concentrate on the basic, irreplaceable tasks of helping his students to discover new knowledge and of providing them with motivation and advice.

45. Of the new technology, television and radio appear most promising for immediate adaptation to educational use in the Asian countries. Fairly good national networks already exist throughout Asia, and some experimentation in educational utilization has taken place. Educational radio and, to a lesser extent, educational television are being utilized in Thailand and the Philippines. Educational broadcasting, based on systems analysis, is foreseen in the near future for Indonesia. Afghanistan is at present using radio broadcasts for teacher training. In Singapore, educational television is becoming increasingly more important in classroom teaching as well as in-service training of teachers. India is developing programming and production units, in close connexion with curriculum development, for polyvalent audio-visual software to be distributed through different networks (educational television) or through film libraries, or directly to schools. Experiments in programmed instruction are also being undertaken by several of the Asian countries, either through national institutions or private institutes. Experimentation and evaluation are also being conducted in other areas. Particularly advanced materials in science teaching have been developed in some countries. Audio-visual materials are also being rapidly developed and now offer an extensive range and choice. INNOTECH, now located in Singapore, offers training courses in educational technology for South East Asian specialists.

46. It will thus be seen that a beginning has already been made. With the pressure of the rising demand for education and of the problems of qualitative improvement, the search for new methods and techniques is bound to become even more active. It is necessary that this search should be guided along systematic lines. The introduction of technological attitudes into educational organization in the developing countries is a complex process, and it is only by taking a realistic view of the dynamics of technology that practical results can be achieved.

(i) First it is necessary to develop and adopt a coherent overall view of the technical choices available in relation to the specific educational situation in the country. Fragmentation of schemes has to be guarded against. Micro-systems should be developed first, preferably in those areas least encumbered with antiquated structures. A certain degree of flexibility should be observed in calculating the length of the preparatory period that should precede the changeover to the macro-system. Similarly, within any given programme, a number of alternatives needs to be kept open, so that a competitive spirit may be maintained and a process of natural selection may operate.

(ii) At the same time, an effort must be made to create the material infrastructure for innovation. One of the first tasks, especially in countries with limited resources, will be to see if there are any technological resources that could be more fully utilized - e. g. broadcasting agencies, printing facilities, data processing centres, etc. It will be essential to co-ordinate the use of such resources within the framework of an overall plan. An attempt must also be made to improve co-operation between the various occupational groups concerned with the development of education.

(iii) Particular care has also to be taken to develop institutions and centres for the promotion and demonstration of innovation, whose task it will be to produce - or to get those concerned to produce - new school curricula, new systems of evaluation and control, and the new teaching materials. The aim of these institutions will be to inform and to train - to inform the public and to train the teachers and change the old patterns that they have been accustomed to follow in order to prepare them for the new rôles that educational technology has marked out for them.

47. As all countries may not be able to afford to establish such centres, certain countries may benefit from the experience of those existing in other countries, and information should be exchanged between such institutions. Cost-effectiveness studies on new educational techniques should also be made. It is clear that the effectiveness of new techniques and methods will depend on the preparation of teachers for their utilization. Such preparation should become a part of teacher education programmes, and teacher-training institutes should become active centres of technological innovation, so that the teachers they prepare are ready to innovate, experiment and participate actively in the process of introducing new techniques and methods in education.

Chapter 6

RESEARCH AND DEVELOPMENT: INNOVATIVE APPROACH TO EDUCATION

1. Until recently educational research in the region was associated with what a few university departments of education and some teacher-training institutions did, or were expected to do. It did not find place in any national scheme for educational development. In recent years, some of the countries have adopted a policy of promoting educational research: national institutions exclusively devoted to educational research are being organized and encouragement is being given to the training of research workers. Precisely because countries in the region are taking the first steps for developing and mobilizing research capabilities for educational development, it is necessary that consideration should be given to evolving an appropriate strategy of research suited to the urgent needs of the countries.

2. There are three different types of activities which are linked to change in professional practice in any field of endeavour, namely, (i) research, basic or applied; (ii) development, and (iii) diffusion and widespread application. The prospects of research in education will be more promising when these three activities are linked closely together. There is an important place for research, the sole purpose of which is to discover new knowledge, but, in view of the multiplicity of problems which education systems must face, higher priority has to be given to the application of knowledge to the solution of these problems. The distinction among the three types of activities is made on the basis of their end-products. Within the field of research, the distinction between basic and applied research is somewhat tenuous but has a pragmatic usefulness in drawing attention to the elements which have a bearing on the innovative process. The term "development" may be described as the use of the results of basic applied research for the purpose of creating useful materials, devices, products, systems and processes, or for effecting improvement of existing ones. Examples of "development" in education include new organizational forms for schools or colleges, new techniques for teacher-training, the construction of curriculum units, the creation of instructional devices, the preparation of programmed instructional materials, or television programmes or films. The research support for such development work derives from knowledge about learning, motivation, and instruction. The third term - "diffusion" - includes a variety of processes through which a product or service is put into widespread use. Research and Development taken with diffusion form the innovative approach.

3. Innovation might be described as the introduction of a new idea, process or technique and its adoption for widespread use to replace an existing practice or technique. It is not change for the sake of change. It is controlled and regulated by testing and experimentation. There is first invention or research, then its testing out, evaluation and development, then diffusion and lastly adoption for use. An innovative approach therefore implies an awareness of the inadequacy of an existing practice or technique, an attitude of searching for new ideas, a willingness to test them and put them to use.

4. The innovative process is illustrated by recent developments in agriculture in Asia. Research provided the possibility of high-yielding and fast-maturing food plants. These were tested and tried in different conditions and subjected to modifications. The varieties so developed were then demonstrated through agricultural stations and their widespread use is being promoted through agricultural extension services. A research discovery by itself does not lead to adoption. The links of development and promotion have to be forged before the chain leading to adoption and use is complete.

5. Research and Development effort could be deliberately planned and directed to the problems of educational development, both quantitative and qualitative. This will require a series of measures:

(a) establishment of a mechanism for policy-making in Research and Development at the national level;

(b) reorganization of the institutional framework of educational research;

(c) training and preparation of specialists needed for Research and Development;

(d) provision of financial support to Research and Development; and

(e) creation of a suitable mechanism for inter-country collaboration in Research and Development.

6. One reason why educational research has so far contributed only marginally to educational development is its fragmentary character. When Research and Development are linked in a single process and related to educational policy and programming, the need for unified direction becomes imperative. It is therefore appropriate that at the national level a suitable council or committee be established which will be responsible for formulating an overall strategy for educational Research and Development in the coming decade. It should be interdisciplinary in its composition and should in particular include research specialists from agriculture and industry where the experience of Research and Development has been so successfully

demonstrated. The council should have its own secretariat to make it possible for analytical studies to be prepared for the council's work. The functions of the council might include:

(a) establishing priorities for educational Research and Development and identifying the programme areas to which Research and Development should be directed;

(b) determining how the organization and activities of the existing institutions should be modified so as to serve priority areas of need more effectively;

(c) determining to what extent and in what areas adaptation of the work done elsewhere can replace indigenous Research and Development;

(d) determining policies for building up multidisciplinary teams of Research and Development workers;

(e) allocating resources for different programmes of Research and Development and devising new budgetary processes suitable for research and development activities;

(f) developing informational links with educational Research and Development work in other countries.

7. In order to facilitate policy decisions, the secretariat of the council should carry out analytic studies such as the following:

(a) review of existing situation of educational innovation as regards institutional organization, staffing, nature and magnitude of operations and its link with educational planning and educational practices;

(b) comparative analyses of educational Research and Development activities in different countries;

(c) analysis of problems in the educational system which require innovative approaches together with review of relevant experiences of other countries and models;

(d) analysis of new and effective means for achieving educational goals based on joint team work by Research and Development institutions, other relevant units of education system and mass media experts.

8. A number of countries in Asia have in recent years made a beginning in establishing institutions for educational research. The general pattern of the institutional form comprises (i) research done in university departments of education or social sciences research institutions which may undertake research of interest to education; (ii) a national institute, generally supported by public revenues, for educational research; (iii) departments or units in the governmental machinery engaged in activities ancillary to research such as data collection, surveys etc.; and (iv) special research-supporting activities such as manpower forecasting, clearing-house services and others. (1)

Three features of the above set-up are noticeable: the programme areas are not identifiable (a programme being a set of activities which are directed to a specific desired outcome for a specific stage of education); the development component is not identifiable; and there is no link between the educational research institutions and the schools.

9. In any organization - or reorganization - of educational research effort along Research and Development lines, it is the *development* component that has to be built into the structure and linked to a diffusion network. In other words, it would appear appropriate that the national institutes should be Research and Development centres. Diagram I attempts to illustrate this.

10. The question arises of whether a single institution should be organized to cover a wide range of educational problems or the institutional structure should be designed around specific programme areas. In view of the limitation of staff and other resources, it would appear more appropriate that the concentration should be on specific programme areas. The experience of agriculture would suggest that the best results for "*development*" are achieved by such concentration (in agriculture, for example, single crop improvement centres were established). In education, the most successful programmes so far have been those which were focused on a set of clearly definable processes, for example, elementary science or use of media in education. Such programme-centred organization can either take the form of reorganizing existing institutions in a country so that each one concentrates on a particular programme area; or in cases where there is a comprehensive national institute, to look upon it as a "federation" of units, each of which is centred on a programme area. Organization - or reorganization - along the lines of programme-centred units or institutes would call for a careful examination of priorities in which the individual interests of research workers must balance against considerations of priority attached to a particular programme. Some of the programme areas which identify themselves as requiring priority attention are: educational planning and management, curriculum development and instruction, teacher training and educational technology.

11. The institutional framework for "diffusion" (through the steps of demonstration leading on to dissemination) would comprise the experimental institutions and the demonstration institutions recommended in Chapter 3. An important problem concerning educational Research and Development is that of the time lag between research and the application of its findings in the classrooms. It is also important that the findings of research be

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(1) Information about the institutional structure of educational research in Asia is compiled and analysed periodically by Unesco: *Directory of Educational Research Institutions in the Asian Region* (1967 and 1970), Unesco Regional Office for Education in Asia, Bangkok.

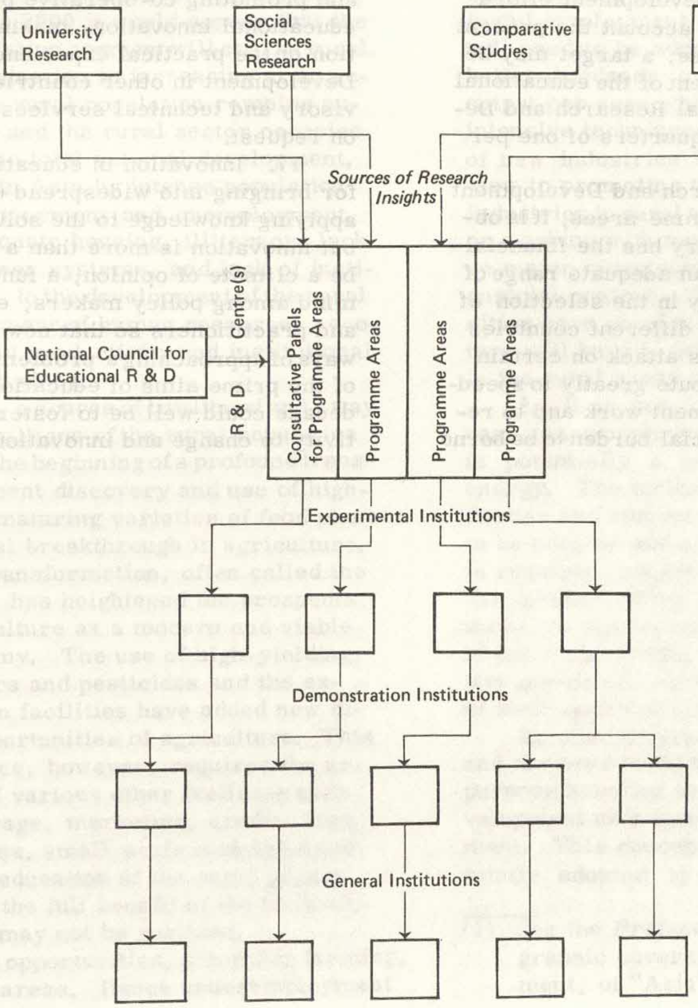
widely disseminated in easily understandable form so that they can be of use to all those concerned in the educational process.

12. While institution-based Research and Development effort is essential, there is an important rôle in it for practising and prospective teachers. The involvement of teachers organically in educational Research and Development will be an invaluable preparation for the stage when the product is introduced for system-wide use. Moreover the collective experience of teachers has a vital contribution to make to educational innovation.

13. Research and Development by its very nature is an interdisciplinary activity. The basic task in building up staff resources is therefore the development of interdisciplinary teams of research workers and practitioners. It has to be recognized that a major limiting factor in the growth of educational Research and Development is the availability of personnel representing an appropriate spectrum of disciplines. In the initial stages it may be wiser to limit the scope of work to accord with the supply of available personnel with interdisciplinary background rather than to undertake large-scale programmes and increase the number of staff representing a limited range of specialities. The recruitment of talent for education is certainly one of the priority areas of action and would call for appropriate changes in salary schedules and, even more important, in the working conditions which are created in institutions devoted to research - positive encouragement to a spirit of experimentation, greater degree of freedom in carrying out experiments and recognition of meritorious work.

14. The training requirements for the staff follow from the interdisciplinary nature of educational Research and Development. The aim should

DIAGRAM I



primarily be to weld together into a team persons with different academic background so that they are able to bring to bear on a particular programme the insights from their disciplines together with an understanding that their disciplines are linked to other disciplines. The type of training is found to have a determining influence on the type of research that is undertaken. The emphases in the traditional form of educational research on techniques and methodologies rather than on problems to be solved have arisen from the type of training which prepared the educational researcher. For educational Research and Development work the appropriate form of training might not be methodological courses but on-the-job training in institutions where Research and Development work is undertaken.

15. Financial blocks to innovation account for much of the delay or neglect in incorporating promising discoveries, processes and systems in education. At present investment in educational research is so small that it hardly counts as a factor in educational costs. A deliberate policy decision has therefore to be taken to ensure that a due share of the educational resources is given to educational Research and Development effort. It is suggested that, taking into account the present level of educational expenditure, a target may be fixed whereby half of one per cent of the educational budget is devoted to educational Research and Development by 1975 and three-quarters of one per cent by 1980.

16. If educational Research and Development is centred on specific programme areas, it is obvious that no developing country has the financial and staff resources to cover an adequate range of such areas. Complementarity in the selection of programme areas as between different countries so as to make possible a mass attack on certain common problems can contribute greatly to speeding up Research and Development work and to reducing the weight of the financial burden to be borne by individual countries. The products or processes developed in one country could then be tried and adapted in another country which has more or less similar conditions. The process of pre-testing and adaptation would still be required but it would be much less resource-intensive than building a product from the ground up. The scope for international assistance and co-operation is notably significant in the area of Research and Development. An increasing volume of work is now in progress in many developed countries on educational Research and Development, the findings of which can be made available to Member States on a continuous and systematic basis. Identification of programme areas and designing of suitable Research and Development projects is another area where international expertise and experience can play a useful rôle. Of particular importance is the training of national personnel in institutions where Research and Development work is in progress. The development of national centres and inter-country co-operation and exchange would be strengthened if a regional programme were evolved with its focus on educational research, development and innovation and with responsibility for designing and promoting co-operative projects for specific educational innovation, making available information on the practical experience of Research and Development in other countries and providing advisory and technical services to Member States on request.

17. Innovation in education is a technique for bringing into widespread use the results of applying knowledge to the solution of a problem; but innovation is more than a technique. It has to be a climate of opinion, a fundamental attitude of mind among policy makers, executors of policy and practitioners so that new and more effective ways of approaching a problem may be found. One of the prime aims of educational policy in the next decade could well be to foster a heightened receptivity to change and innovation.

III. SELECTED PROBLEMS

Chapter 7

EDUCATION AND DEVELOPMENT IN RURAL AREAS

1. Asia(1) with about 11 per cent of the world land area has the largest rural population. Nearly 35 per cent of the world's rural population is in Asia. Out of the total population of 825 million in the region in 1960, about 665 million were in rural areas. It is estimated that the percentage annual rate of growth in Asia in the period of 1960-1980 is likely to be of the order of 2:1 in rural population, and in the year 2000 it would appear that the majority of the population segment will still be rural.

2. While urbanization is increasing at an accelerating rate, the rural population remains numerically dominant and the rural sector occupies a crucial place in the total national development. It is characterized in Asia by intense population pressure, underemployment and unemployment, malnutrition, inadequate housing, illiteracy, lack of transport and power systems, and lack of institutional structures. In the development of the rural sector, the development of human resources, economic resources and productivity and institutional resources are intertwined.

3. Agriculture, a source of livelihood and a way of life for the vast millions of the rural population in the region, is at the beginning of a profound transformation. The recent discovery and use of high-yielding and early-maturing varieties of food plant is a major biological breakthrough in agriculture. This agricultural transformation, often called the "green revolution", has heightened the prospects of developing agriculture as a modern and viable sector of the economy. The use of high-yielding varieties, fertilizers and pesticides and the expansion of irrigation facilities have added new dimensions to the opportunities of agriculture. This technological advance, however, requires the urgent development of various other facilities such as processing, storage, marketing, credit, land tenure, co-operatives, small-scale industries and, equally important, education of the rural population, without which the full benefit of the technological breakthrough may not be realized.

4. Employment opportunities, other than farming, are limited in rural areas. Hence underemployment and unemployment are, in practically all countries of the region, a prominent feature of the rural population. The remedy for this deep-seated problem does not lie in any single approach, through education or any other sector. Rather, it calls for measures taken throughout the economy which will have their focus on creation of employment opportunities and a milieu in which further meaningful employment can be self-created. Strategies will need to be adopted to enable agriculture to pay better dividends to more farm families by raising output per acre while retaining relatively labour-intensive techniques. Policies relating to location of new industries have to be re-examined with a view to promoting the development of small-scale industries in rural areas (processing farm products or working with metal, cloth, leather) and setting up major industries in rural towns or in rural industrial centres. The disproportionate share that cities have received in expenditure for infrastructure will have to be readjusted so that public works in the rural areas are stepped up.

5. It is now coming to be realized that the vast underemployed and unemployed population is potentially a powerful source of productive energy. The technology for raising levels of production and standards of living exists, but it needs to be adapted and applied to the rural sector. What is required is a concentrated effort, supported by the development of appropriate institutional structures, to tap and mobilize the latent capabilities of the rural people through incentives for productive occupations and to involve them in the affairs of their community and nation.

6. The integrated nature of rural development and the need to mobilize human resources for the purpose have led to the concept of community development as a means of achieving rural development. This concept was clarified in a definition jointly adopted by the United Nations and its

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(1) See the Preface for an explanation of the geographic coverage, for the purpose of this document, of "Asia" or the term "region".

Specialized Agencies in 1956. In this definition the aims of community development were identified as: (1) improving economic, social and cultural conditions of communities; and (2) integrating the communities in the life of a nation to enable them to contribute fully to national programmes. Two essential elements of this concept were indicated: (1) participation by the people in efforts to improve their level of living with as much reliance as possible on their own initiative; and (2) the provision of technical and other services by the government and other agencies in ways which encourage self-help and mutual help.

7. Education, both formal and informal, is one of the elements that enters into the complex of factors on which community development is based. The direct contribution comes, firstly, from formal education in terms of knowledge, skills and attitudes which increase man's capacity to further his own productivity and well-being, thereby contributing also to the betterment of the community. Education is desirable for the rural people for exactly the same reason as it is desirable for a nation: without knowledge there can be no progress. Secondly, there is the influence of the school, as an institution, on the community. In many rural villages a school is the only organized institution available and school teachers the only point of contact with the world outside. Even in other rural communities where more institutional structures are available, the schools form an important source of influence on the community. This institutional influence of education is magnified greatly if the educational programme and personnel become actively involved in the development of the community. And, thirdly, the influence of education affects the rural people through mass media as well as the formal systems of education and training. Since the rural environment is also an agricultural environment, education oriented towards agriculture and related activities occupies a significant place in rural community development. For instance, the full benefits of the dramatic changes that are under way in agricultural production cannot be realized without a matching effort to increase educational opportunities and raise the literacy level of the rural population. To make the new techniques and other elements of production and distribution in agriculture widely known, agricultural education will have to be considerably strengthened.

8. The progress of education in the rural areas of Asia has been uneven. As regards the level of literacy, as in respect of all other indicators of levels of living, there is a marked disparity between the urban and rural populations. The high illiteracy rate in the rural population is compounded by an extremely high illiteracy rate among women in rural areas.

9. It is estimated as an order of magnitude that there are 77 million children in the age-group 6-12 in the rural areas of Asia who are not enrolled in schools at the first level. The degree to which the enrolment ratios in rural areas fall behind the enrolment ratios in urban areas ranges from 20 to 75 per cent. Then there is the problem of drop-out and wastage. The studies carried out in some countries of the region show that drop-out and repetition take a bigger toll in rural schools. For example, a study made in Burma found that the drop-out rate in rural schools was 73 per cent as against 61 per cent in urban schools. In Iran, the percentage of wastage between grades I and VI was found to be 17 per cent in urban areas and as high as 57 per cent in rural areas. In the Philippines, a study was made which revealed that the holding power in grade VI in rural schools was less than half of the holding power of the same grade in urban schools.

10. Beyond the first level of education, educational opportunities for the rural population in most Asian countries diminish rapidly at each stage until they reach the narrowest point at the third level. The most important gap is between the first and second levels of education. From the point of view of human resource development - and this is a fundamental problem for rural development - lack of facilities for education and training beyond the primary school level is a crippling handicap.

11. The schools that serve the rural population vary in size, structure and environment - from one-teacher schools to large and crowded secondary schools, from schools in sparsely settled areas to schools in rich agricultural lands. One of the most important problems in effective education in rural areas is the adequate preparation and supply of teachers. The qualification level of the teaching staff in rural areas is appreciably lower than the national average. Since the supply of teachers for rural areas has always lagged behind that for urban areas, rural schools generally have more crowded classes and the shortage of teachers is particularly acute in curriculum areas which are of critical importance in the improvement of rural education: agriculture, science, mathematics, environmental education, rural health etc.

12. During the next decade many countries are planning for a quantitative expansion, which in Asia will primarily mean expansion of education in the rural areas. But the problems of education in the rural areas are not only quantitative; they are related to the quality of education. Providing education which is qualitatively relevant and quantitatively adequate for rural areas presents a variety of problems. Some of these are concerned with questions of resources (both financial and material) while others are linked to fundamental issues of educational policy. Should education in the rural areas have different purposes and orientation from those which are conceived for other pupils? Should the structural pattern of institutions be uniform throughout a country or are there special features of education in a rural environment which call for special institutional structures? Are the problems of rural children and of

rural schools different in kind and degree from those of the urban sector? What is the function of the school in the community? Questions such as these raise fundamental issues to which clear answers are not always discernible in national educational policies and plans.

13. Evolution of national education systems with common goals and purposes is a prerequisite for a relevant and meaningful development of education in a country. The main goals of education are the same for all communities, just as these communities, whether rural or urban, are seen as one nation. This concept is a reflection in education of wider social, political, economic and ideological forces which are making for a larger national identity. A unified education system, however, does not mean uniform education, nor does it ignore the differences between urban and rural communities with respect to the ways and means of developing education programmes related to their needs and environment.

14. The rural environment, and this includes the agricultural environment, is particularly rich in materials which, in the hands of skilful teachers, can lead to creative teaching. The environment provides unrivalled opportunities to develop childdren's understanding and appreciation of physical, biological, social and economic phenomena. Curriculum development in relation to the needs of rural children has to make use of these learning experiences. For example, the teaching of science integrated with agriculture; pre-vocational learning experiences related to the operations of rural industries, agriculture, co-operatives, etc.; technical and vocational education oriented to the skills requirements of the rural sector - these can make education qualitatively relevant to the process of rural development.

15. Attempts to modify the curricula in rural schools by linking them to the environment have generally taken the form of introducing agriculture as a teaching subject in lower secondary schools and even primary schools. Many of these schemes and projects have led to disappointing results. The failure has little to do with the basic principle that the education of children should draw on their actual experiences and relate to their environment. The reasons for failure have lain in the fact that the basic concepts and practice of agriculture have not been transformed into appropriate curricular activities. The analogy with the teaching of science is instructive. When scientific concepts and the practice of science are fused and adapted to the learners' interest and capabilities, the teaching of science evokes the learner's response and generally high enthusiasm. Similarly it was at one time considered that technology was not a suitable subject for young children although it is now recognized as both teachable and capable of evoking a response. A similar curricular "transformation" has to be made in the teaching of agriculture so that school agriculture becomes as acceptable pedagogically as school technology.

16. Of notable importance for rural development is the training of out-of-school youth. The out-of-school youth in the rural areas are either active farmers or prospective farmers. Often their training needs are neglected on the assumption that they will receive their farming knowledge from their parents. The introduction of new techniques and practices in agriculture will necessitate a systematic programme of farm training for out-of-school youth. Educational institutions in the rural environment have therefore also to be designed to meet their needs.

17. Curriculum development for rural environment, changes in teaching methods and objectives, adaptation of the school to developmental needs in rural areas - these are all continuing processes in the qualitative improvement of education. There are other problems and difficulties which lie within the immediate province of educational administration and management - the training and supply of adequately prepared teachers, textbooks and instructional materials, school buildings and equipment, supervision and administration.

18. In the earlier phase, when the output of the education systems was small and the systems mainly served the urban centres, the source for the supply of teachers for rural areas was limited to the pupil-teachers selected from primary schools. In the last two decades, teacher-training systems in all but a few countries have expanded on a scale that should ensure (subject to policies which provide an incentive through good salaries and professional status) that the demand for teachers can be met quantitatively from the output of the system. Most countries in recent years have been following a policy of dispersing the location of educational institutions, and increasingly secondary schools and teacher-training institutions (in some countries even universities and other third-level institutions) have been established in provincial towns, or districts and sub-district townships.

19. The priority areas of need would now appear to be: the preparation of teachers for the kind of tasks that they are to carry out in rural areas and a continuous development of their qualifications and educational experience to prevent the stagnation that isolation in the rural environment can impose.

20. In the training of teachers, the crucial question is whether teacher-training programmes should be designed specifically for prospective teachers in rural areas, or be more general in their orientation so as to prepare teachers to serve anywhere. There are two facets of teacher-training programmes for teachers in rural areas which need to be re-examined. First, there is the need to improve teacher education programmes in regard to specific problems of curriculum development for rural schools, the problems of drop-out and repetition, the problem of teaching the beginning grades in rural schools, problems of multi-grade teaching in one-or two-teacher schools, preparation

of teaching aids using local materials, teaching of scientific concepts, the use of environmental materials in teaching, teacher-made evaluation procedures, and organization of extra-curricular activities for rural youth.

21. The other facet is the new rôle of the teacher and of the school in rural development. Where the teacher is an educational agent and the school a development centre, the preparation of the teacher for this rôle becomes a much more complex process. It will include training in such things as agricultural and co-operative extension, rural health, etc.; skills for teaching and guiding young people in rural areas who belong to different age-groups and have a variety of interests - those who are following the formal course of schooling as well as those who have left or dropped out of school.

22. Pre-service teacher-training programmes should include a wide range of disciplines in preparation for the multifarious tasks that rural teachers must assume. In other words, in some curriculum areas the teachers should preferably have some practical experience in agriculture, home economics, handicrafts, etc. The rural teacher should also have strong leadership training, as he will often be called upon to lead in many rural community activities.

23. The teacher in a rural school, even more than his urban counterpart, needs the stimulation of continuous education to renew himself professionally and to upgrade his qualifications and competence. In most countries of the region, in-service training programmes are receiving increasing attention. Such programmes can make an important contribution to the qualitative improvement of education in rural areas and the enhancement of education's contribution to rural development.

24. The needs of educational development within the framework of the development of the rural population have stimulated a search for new forms and structures of education. One of the most promising lines that has been explored in many countries is the concept of school as a development centre or a community school. It has three principal aspects:

(1) to develop a meaningful and relevant teaching programme in the school;

(2) to reorient the school to serve as an instrument of development; and

(3) to make the school a centre for the education and training of those members of the community who are outside the formal school system.

25. The school as a development centre is one that derives its programme from the problems of the community which it serves and which draws upon available local resources in its attempts to solve these problems. This means that the curriculum of such schools should reflect the problems of the community, particularly the living conditions of the people. These needs should be constantly determined by the school, and the educational programme tailored for both young people and adults to enable them to realize their problems and exert efforts to help in their solution.

But there is more to a development school than a set of subject matter syllabuses using local conditions. Such a school is, in the fullest possible sense, not just a school which stands in the community and where children go to learn. It is a development centre which is open to all age-groups to meet their training and cultural needs. This approach to rural schools implies a truly integrated education system in the rural areas. It involves not only articulation of the stages of formal education but also co-ordination between the formal system and the training of those who are not in school, both youth and adults. In this light, a school becomes the centre not only for the education of children but also for the continuing education of other members of the community.

26. As education expands and its range is increased, the problems of education for the rural population become more urgent and call for attention in national policies. The difficulty of identifying the basic issues and evolving alternative methods for their possible solution is compounded by lack of adequate data and studies of rural environment and rural schools. The challenging opportunities to study, explore and innovate rural education have yet to find a response from educational researchers and planners.

27. The educational plans are generally conceived in terms of broad national aggregates. Since the rural population forms a major sector, it is necessary that the national aggregates should be broken down by appropriate regional units in a country and the educational growth profile of the rural population clearly identified. This will enable plans to be drawn up for the progressive expansion and enrichment of educational opportunities in the rural areas.

Chapter 8

ADULT EDUCATION AND LITERACY

1. Asia has the largest illiterate population in the world. It is estimated that the region now contains more than 243 million illiterates in the 15 to 44 age-group, i.e. the economically active age-group. The illiteracy rates, however, vary from one country to another - at one end of the scale exceeding 80 per cent, and at the other end (in very few cases indeed) virtually nil. Within individual countries, there are areas where illiteracy rates are relatively high and other areas - namely, urban and urbanized areas - where illiteracy affects only a minority.

2. The illiteracy rates of 70 per cent and 35 per cent are regarded as critical points in the progress of literacy. In countries with rates exceeding 70 per cent the number of illiterates has been found to increase; only in countries with illiteracy below 35 per cent does the number of illiterates decrease. Since a number of countries in Asia have illiteracy rates over 70 per cent and only a few have managed to reduce the percentage below 35, the problem should be expected to become increasingly severe unless adult literacy plans are systematically formulated, keeping in view the rates of population increase and the targets of first-level education in the formal education system.

3. In all countries of the Asian region, the major proportion of the adult population has less than primary education. About 10-15 per cent of the population have completed primary education and only about 4-6 per cent have completed secondary education. In the rural areas of Asia, only a minute percentage of farmers have completed primary schooling; the majority of the privileged few who have attended their village school have done so for only three or four years. The great mass of Asian farmers have remained either illiterate or semi-literate and are thus deprived of the basic understandings and skills needed for participating in the modernization of the agricultural sector which is a vital issue for sustained development.

4. The high rate of population increase and the inadequacy of the formal school system to deal fully with the problem of illiteracy make it essential that an adult literacy programme of sufficient magnitude be developed. Member States with illiteracy percentages in the neighbourhood of 70 per cent will have to make very substantial efforts to reduce the problem to a manageable dimension. While the social objectives of national planning would suggest that emphasis be given to literacy for women and the rural population, from the point of view of the economy it would seem desirable to give priority to people in the active 15 to 44 age-group, particularly those who may be expected to gain the most from the educational input.

5. The development plans of Asian countries have set two major goals: industrialization and the modernization of agriculture. Industrialization is inconceivable without skilled and specialized labour at the different levels of the enterprise. Industrial training includes elements of vocational technology, drawing and mathematics, safety measures, hygiene and socio-economic and civic matters. Mastering of these subjects requires a certain level of literacy. This is where functional literacy comes in. The significance of work-oriented adult literacy goes beyond that of job training linked with literacy: it is an educational activity, aimed at both the intellectual and civic training of the workers and their adaptation to the industrial environment and its technical requirements.

6. In Asia, economic growth and the rise in the countries' overall output will be determined in the coming decade primarily by the development of the agricultural sector. The "green revolution" has been spearheaded almost entirely by the larger and more prosperous farmers possessing, inter alia, high educational levels. A serious obstacle to further rapid dissemination of the new agricultural technology is the general lack among poorer and less educated peasant farmers of the technical knowledge to support successful cultivation of the new seed varieties.

7. Adaptation of functional literacy to development does not mean the total domination of education by economic considerations. Adult education, including functional literacy, is equally concerned with the most pressing social needs - health, nutrition, civics, family planning and housing, as well as with cultural and ethical needs.

8. For a long time, following the practice in more developed countries, adult education in most Asian countries had little to do with vocational training. This is now changing and adult education and vocational training are becoming more closely linked. A variety of institutions are being involved in promoting adult education. For example, in Iran it is the Army of Knowledge. In the Philippines and the Republic of Viet-Nam, elementary schools are extending their primary objective to include adult education - a complementary but necessary activity designed to help parents and other adults overcome conflicts between knowledge imparted by schools, on the one hand, and local culture, on the other, or to consolidate the instruction acquired in their own school years. Then there are agencies such as those concerned with community development, agricultural and other extension activities, which promote adult education as an integral part of their special programmes.

9. In considering adult education programmes

it is best to emphasize the point that adult education covers a wide range of activities, from instruction in rudimentary literacy to high-level educational programmes; and that it is carried out by a variety of institutions, ministries of education, agriculture, health, labour, rural development, social affairs, co-operatives, as well as private agencies.

10. Adult education needs to be properly identified and integrated into national development plans and policies. This involves, among other things, its integration into national development priorities and its acceptance as an integral component of development projects, structures, programmes and activities. It also requires provision of financing and appropriate services not only in the budgets of the ministries of education but in those of all other ministries concerned with the operation of adult education activities. Legislative measures and appropriate administrative structures for out-of-school education, for youth and adults, both at the central government level and State or provincial level, must be established. Supporting services must be promoted, e.g. institutes of educational research, departments of audio-visual aids, radio and television programmes. The greatest importance should be attached to the involvement in adult education of those bodies responsible for development projects requiring the participation of workers or farmers. Co-operation and common action should be assured through firm institutional arrangements.

11. Lack of qualified personnel has proved in practice to be a serious barrier to the effective integration of adult education into the national education system. One of the first steps to be taken is to place adult education upon a professional basis.

In order to train highly qualified professional staff, it would be useful to establish graduate courses in adult education leading to a degree. Graduates of such a course could staff adult education departments and teacher-training institutions to provide basic courses for elementary, secondary, vocational and agricultural teachers. Courses in adult education should be included in the curriculum of the pre-service teacher-training institutions as well as of in-service training programmes in Asia and this will need to be functionally biased.

12. Adult education, including adult literacy, has usually been understood and defined as a term covering educational activities in which adults engage, that is as a field; there is also a growing realization among educators and administrators of the need to consider adult education as a discipline, that is as a body of scientific knowledge resulting from studies and research.

13. Interdisciplinary studies and research should be undertaken in co-operation with universities and appropriate institutes on subjects related to out-of-school education and more particularly to adult literacy, such as the relationship of literacy to educational planning and economic development, the methods of teaching reading and writing to adults and the adaptation of methods of particular professional and cultural groups. The focal point for this work in the Asian region will be the International Institute for Adult Literacy Methods established in Teheran (Iran). Apart from the organization of research into new media and methodology, other important concerns of this Institute will be the strengthening of documentation services and the planning of training facilities.

14. The total and permanent eradication of illiteracy is the Asian region's ultimate objective. This objective reflects essentially differing concerns: ethical, political, social, cultural or economic. The choice of approach in literacy depends on the objectives a government sets for itself. Traditional literacy, with its mass campaigns, its extensive and diffused approach, and functional literacy, centred on development, with its selective and intensive approach, are not mutually exclusive. As in the case of Iran, a country can embark on a mass campaign at the same time as it organizes functional literacy activities within the limited framework of agricultural or industrial development projects. Functional literacy is not a new method of reading or writing. It is a process, totally integrated into a development project. It provides a new type of curriculum development starting with the identification, in a given milieu, of the problems that impede workers' and farmers' effective participation in the processes of economic and social development.

15. Thus, and this is one application of the principle of selectivity, development projects and problems should be chosen where illiteracy is a serious obstacle. While the integration of literacy and vocational training is an essential element of the functional approach, its long-term objective is of course the education of the individual, in a context of permanent education. From this viewpoint, what is most important is not the actual ability to solve a specific problem, but the acquired capacity to solve any new problem. Functional literacy is a kind of mental training in which the adult becomes accustomed to transferring the knowledge and skills he has acquired to other fields where they are applicable. He learns to learn. This indeed is one of the preliminaries of development, which is a continuous process calling for constantly increasing skills. Development also requires better social integration. Functional literacy is a valuable educational exercise in citizenship, one which helps to nurture positive attitudes to the problems adults have to solve and an active spirit of co-operation and responsibility in dealing with their collective problems.

16. Literacy planning is a new field in which planning experience has to be gained and the training of responsible officials organized. Long-term plans for functional literacy properly integrated with the priorities of economic and social development, particularly educational plans, should be a

matter of primary concern. The planners will have to develop criteria for the selection of projects; standardization of procedures; presentation and analysis of statistics; openings and opportunities for linkage of literacy programmes with suitable programmes of formal education.

17. It was at the World Congress of Ministers of Education on the Eradication of Illiteracy, organized by Unesco in Iran, that the representatives of 89 countries - including many Asian countries - adopted the functional approach. Today, Unesco is actively engaged in a World Experimental Literacy Programme in several Member States. In Asia, experimental projects are being carried out in Iran, India, Afghanistan and Laos. Promising results have already been achieved. More projects are now being prepared in the Asian region, some with Unesco's technical assistance, others using only national resources. The experience acquired in these projects should prove of value to other countries which are now engaged in concerting effective measures to deal with the problems of adult education and literacy.

Chapter 9

SCIENCE EDUCATION

1. The Conference on the Application of Science and Technology to the Development of Asia (CASTASIA), which was held in New Delhi in 1968, drew attention to the crucial rôle of science education as "the principal means, particularly in the developing countries, for transmitting scientific literacy to a broadening stream of population as well as for creating the scientific and technological manpower necessary and indispensable for economic and social advance".

2. During the last fifteen years, there has been increasing interest in science education reform in several parts of the world - first at the secondary, then at the primary and the tertiary levels as well. These "projects", commonly known as science curriculum projects, constitute a rich body of knowledge and experience which can be most useful to those responsible for planning and designing science education projects in Asia, and to those engaged in the development, evaluation and execution of such projects.

3. The "first generation" science curriculum projects, which were in their development stage during the 1956-1960 period, were mainly concerned with the secondary level. They came about as a result of profound dissatisfaction regarding some characteristics of the traditional science courses. These first science curriculum projects, therefore, placed much emphasis on modernizing the content of the courses, organizing it around important unifying concepts, and showing science as a process of inquiry and investigation; above all, they developed and produced for each new course a coherent set of teaching and learning materials.

4. It was soon discovered that science curriculum reform requires the partnership of teachers, pupils, scientists, educational administrators and specialists in various techniques. Gradually a "second generation" type of project appeared in which: (a) the trials, evaluation and revision of the materials acquired a more important rôle; and (b) the training of teachers in the use of the new ideas and materials was to become part of the design and development phase of the project, and no longer something to be appended after the whole course had been produced.

5. The first science curriculum projects were concerned with the upper level of secondary education - no doubt a consequence of the fact that they were initiated by university professors - and dealt separately with each of the subjects as they appear in school syllabuses: mathematics, physics, chemistry, biology. Some of the most important breakthroughs, however, have been achieved at the junior secondary level and at the primary level. This is of much significance to Asia, considering that in this region the vast majority of children do not continue their formal schooling beyond the primary or junior secondary level. A diversity of elementary courses in integrated science have been and are being designed, catering for different needs and emphasizing different approaches. They are all inquiry-oriented, and the lessons are pupil-centred rather than teacher-centred. From a very early age, pupils are given ample opportunity to make their own observations, to handle equipment, to conduct their experiments and investigations, to discuss their findings with other children and with their teacher, to interpret their results and to draw inferences, to develop a feeling that they have participated in activities that reveal answers to problems and to discover that as they solve problems new questions arise. The emphasis is not on factual knowledge but on attitudes and on mental and manual skills.

6. The problems of science education reform are so complex that a comprehensive effort is needed in order to achieve success. This requires some knowledge of the ways in which the different parts of the science education system affect each other, and more specifically the ways in which a given change in one of them affects the rest of the system. Ideally, even the system of science education should not be considered in isolation: it is part of the system of science and technology education, which in turn is part of the whole of the education system. However, in a first approximation, a less comprehensive approach may be indicated in those cases where the specialized personnel for science education reform is not yet available in sufficient numbers and diversity of skills. In such cases, small-scale experimental projects should be undertaken, the efforts of those few individuals who are trying to do something should be supported, and activities in one or more of the fields discussed below should be encouraged. At the same time plans are to be made for gradually filling in the gaps and for aiming at a comprehensive approach.

7. The teacher constitutes the main link between the learners and the system that is trying to teach them. This is certainly true today, and will remain true even when individualized learning becomes a more common practice. It follows, therefore, that much more attention should be paid to the preparation of teachers for their difficult tasks. In particular the preparation of primary school teachers seems to call for special attention. As new science curricula are put into effect, in-service training of teachers is becoming an important feature all over the world. However, the pre-service training of teachers is generally not being handled

as imaginatively as the in-service programmes. Significant changes in the pre-service programmes would require fairly deep institutional changes. Every effort should be made to change the pattern of teacher training so as to ensure that those who graduate as teachers do not find themselves immediately in need of retraining - as often happens.

8. The problem of improving the preparation of science teachers is a very complex one, and it seems that the greatest effort should be made in trying to teach future teachers in the style in which they themselves will be expected to teach. This seems obvious, but it is generally not done: even in in-service training courses, teachers are often "lectured" on the way in which they should engage their pupils in active learning. The in-service training programmes have also to be strengthened, and the loneliness in which most teachers work must be compensated for in part by providing flexibly conceived teachers' guides and opportunities to discuss their problems with their colleagues. The latter is being achieved in some countries by means of "teachers' centres", sponsored by a university or by a science teachers' association, which function quite informally and on a very moderate budget.

9. The best way to make it more likely that the subtle features of a new science course will be understood by the teachers, and will not be lost to their pupils, is to produce a comprehensive set of learning materials. These materials will have been designed on the basis of the objectives; they will define the content, each part having its own built-in teaching style; and they will refer to the laboratory work whenever necessary as well as to inputs by other communication media. These materials will have been tested several times and revised in the light of these tests in order to achieve maximum learning efficiency.

10. Attempts to reform school science courses can be effective only if examinations and other procedures used to assess attainment encourage the kind of study desired. Thus, the design of examinations is coming to be recognized as a vital part in the process of science curriculum reform. This design requires skill, experience and a clear knowledge not only of the content, but of the aims and of the style in which the science course is taught. Until recently, examinations have placed great emphasis on memorization of the course material, but the new science programmes require something more than this. The following are some abilities that are recognizable and measurable by examinations:

(a) an ability to recall information and experience;

(b) an ability to devise an appropriate scheme and apparatus for solving a practical problem;

(c) an ability to use and to classify information, including quantitative results;

(d) an ability to apply previous knowledge to situations which are quite new and even unexpected;

(e) an ability to analyse information and assess evidence;

(f) an ability to report, to comment and to exercise judgement;

(g) an awareness of the place of science among school subjects and in the world at large.

11. The redesigning of examinations to match the reform in science curriculum is a difficult organizational process, but one that will have to be accomplished if the various curriculum development projects are to be successful. It is suggested that science examinations should include a battery of different types of questions, depending on specific curriculum objectives, including at least some of the following: objective tests, short and long essays, oral tests, laboratory experiments, mathematical problems, and graphic tests. Competence in producing questions suitable for testing the various levels of understanding can only be developed by training. A pool of questions and test items could also be made available at local centres, and teachers should be encouraged to attend sessions at which such questions can be produced and discussed. Furthermore, the results of tests and examinations should be used not only for measuring the achievements of pupils but also as valuable feedback material for a revision of the curriculum materials and for the planning of new ones.

12. The design and development of the equipment (apparatus, simple kits and other materials) for science education is one of the many parts of a curriculum project: tests, equipment and other aids are designed and developed together. There are, however, problems that are specific to the equipment: its mass production, marketing, distribution, storage, maintenance, repair and even utilization. It is impossible in this respect to make suggestions of general validity, given the great variety of conditions all over Asia, and the great variety in the equipment - from expensive apparatus to very cheap kits and supplies. However, it seems advisable to have at least one central service in a country responsible for production and distribution of school science equipment and for the maintenance and repair of those items that cannot be repaired in the schools. This same centre - or it could be a separate service - would also be responsible for systematically supplying on request special biological specimens to the schools, including live specimens.

13. The responsibility for implementing the new science courses in the schools rests with the educational authorities and before they can assume it, they have to make sure that all the required conditions are fulfilled. This may sound obvious, but too many cases have been known of schools that were required to adopt a new course without having the necessary books and other learning materials, or of schools which had the materials but no teachers who knew how to use them; or of courses that had to be interrupted because some cheap consumable items had not been replaced. It is clear that a good deal of organization and planning is

required, plus a very flexible and enlightened administration.

14. In addition to science teachers at all levels, there are various groups of more specialized educational personnel who play a vital rôle in the development and operation of science education. Among these groups are those who: (a) teach the future teachers of science; (b) undertake the innovative redesign of programmes of science education; (c) conduct research in science education; and (d) administer and supervise the operation of the system.

15. The training and preparation of these groups is both a difficult and important task. The numbers of such individuals in any group in a given country will usually be quite small (certainly in relation to the numbers of teachers). Furthermore, the individuals in these groups will almost always have had teaching experience prior to undertaking one or more of these special rôles in place of (or in addition to) teaching, and they will be correspondingly older. Consequently, it may be difficult to distinguish between pre-service and in-service (or on-the-job) training for these groups. In the case of some of these specialists, special training programmes for them may be impractical within some countries; but certainly some co-operation in regional programmes would be possible as well as desirable. Furthermore, the developed countries could design, for trainees from developing countries, programmes tailored to serve their special needs. Whatever the case, the effective functioning of such groups of specialists is so vital to the healthy growth and development of the whole system of education that their training should be given high priority and kept under constant review.

16. Strong professional associations of science teachers, drawing their membership from all levels and types of educational institutions, can help minimize the professional isolation of the teacher. Through publications, conferences, workshops, exhibitions and other activities, they can help to keep him informed about modern developments in his field. Science teachers' associations could involve practising teachers in the process of science curriculum reform and in related activities (e.g. examinations reform and the production of teaching materials), and could also organize science clubs, both for school pupils (as extra-curricular activities) and for the public in general.

In addition to science teachers, there are also other groups whose active involvement is essential in the promotion of science education - planners, administrators, researchers and scholars, industrialists, journalists, etc. The mobilization of these should be an important element in the strategy for science education.

17. No programme for change in science education will have a real and lasting impact if it does not engage the understanding and support of the population at large. Otherwise, the home and society in general may undo what the education system will be trying so hard to build. The mass media (radio, television, press, cinema) as well as national museums, science clubs, etc., must put on programmes that will make the public want to participate in the era of change and enable it to do so meaningfully. It has been thought by many in the past that any programme that "looks scientific" will achieve this; but hard facts have shown that this is not so, and that adequate programmes of the sort are very difficult to produce in view of the present levels of education of adults in the region. To achieve significant progress in public understanding of the impact of science and technology on society will require research and experimentation, and of course a massive programme of implementation.

18. The functions and organization of a centre for curriculum design and development have been already discussed. It may be useful, however, to add that there have been several cases where national or other large-scale efforts in science education reform have preceded and stimulated more comprehensive overall efforts. In Asia, a number of countries have established national centres for science education and the experience gained has attested to the value of having national centres whose responsibilities include design, production, trial and evaluation of teaching materials and the study of all dimensions of science education development. The centre should be able to enlist the service and help of multidisciplinary teams of experts including subject-matter specialists, specialists in teaching, administrators and technicians.

19. For science education to develop in a country in accordance with national goals and objectives, it would seem necessary to have a national body with an appropriate legal status, responsible for policy regarding science education. It would be even better if this were enlarged to become a national body responsible for the country's educational policy in science and technology. For such a national body to function effectively, its membership should include all sectors committed to, and concerned with, science education and with modernizing and harmonizing science and technology with economic development.

Chapter 10

TECHNICAL EDUCATION AND TRAINING

1. There has been a substantial increase in enrolments in absolute terms at all levels of technical education in the region. At the second level there was, however, little change in the proportion of pupils enrolled in technical and vocational education during the period 1960-1968. Not only does second-level technical and vocational education appear at a numerical disadvantage when compared with general academic education, but it is also clear that in many countries its prestige is still low and that it only receives students who fail to gain admittance to academic secondary schools. Progress has been made in this regard by improving facilities and employment opportunities and through public information, but obviously much remains to be done if the necessary major changes are to occur. At the third level, there was a notable expansion of engineering education. In some countries of the region, employment opportunities have not kept pace with graduate output; but in others there is an urgent need for more high-level technician and engineering graduates to meet even the present needs of the economy.

2. The special needs of Asian countries may require that technical education and training be oriented towards dominant sectors of the economy such as transportation, building, applied biological sciences including the medical and veterinary areas, or agricultural processing industries, rather than traditional disciplines such as mechanical engineering, electrical engineering, or civil engineering. This may improve student and teacher motivation and facilitate a more immediate contribution to national development.

3. Furthermore, at the higher technician and engineer level, the objectives are not only to produce personnel capable of filling certain defined posts in the productive labour force and, in due course, of assuming more senior positions, but also to train them in such a way that they can be resourceful in the application of technology to new designs. One way of doing this is by creating research and development centres where new designs can be produced and opportunities created for industrial expansion and development.

4. Preparation of technical personnel is a matter of high importance, but it is also cost-intensive. The need therefore for more rigorous planning is evident. Such planning should be concerned with not only the quantitative aspects of supply and demand - important though they are - but also with the qualitative functions of education and training.

5. Part of the work of the central national planning agencies is to determine manpower budget ties to foreseeable national development plans. Admittedly the techniques of forecasting manpower requirements are still not adequate, and the problem is compounded by the paucity of reliable data. An important responsibility of the central planning agency should be to improve the data base and the forecasts. Its studies should consider economic trends, sectorial surveys of manpower needs, demographic factors, and social considerations so as to evolve a broad strategy for the development of human resources. Such budgets may highlight the need for specialized facilities for technical education closely related to major sectors of the economy, for example the rubber industry, mining, or food processing.

The assumption in such planning must be that education and training, including continuing education, should strive to realize the maximum contribution each person is capable of making to the community, but its primary task is to meet the manpower requirements of the economy within the constraints imposed by such factors as natural resources, geographical conditions, fiscal policy and teaching personnel. In this task the central control of such planning must distinguish between social pressures and regional aspirations on the one hand and, on the other, current and short-term economic needs.

Equally important is the survey of the quantitative and qualitative outputs of the education and training systems and their capacity for expansion. Such a survey is basic to any manpower development plan. The training carried out in industry is initially more difficult to survey for various reasons; nevertheless all information as to the degree and nature of the initial and subsequent training given in industry to products of the education system is of importance.

6. In many Asian countries, such surveys will reveal a serious and growing "technician gap" between the professional engineer and the semi-skilled craftsman. This will underline the importance of a fundamental reform in technical education and in the attitudes of the community towards it. The implication of such situations will often be that technical manpower needs can only be filled by the output of general secondary schools, or by less academically qualified personnel in industry, upgraded informally or through organized in-service training or continuing education programmes in order to increase the ranks of technical personnel.

7. As a further step towards meeting manpower needs, it is desirable to classify employment into types and levels in such a manner that appropriate training institutions can be designed to meet national requirements. In this connexion, sectorial training

schemes can be envisaged to meet the needs of the nation in food and agriculture, housing and town planning, health, clothing, transport and communications. Levels of training will also be defined, ranging from semi-skilled workers and craftsmen, technicians and middle-level supervisors, professional engineers and managers. This sectorial definition and grading according to level will enable the manpower situation to be visualized in its comprehensiveness, and be at once indicative of the needs of overall economic development and employment creation.

8. Some countries have already established high-level scientific and technological advisory bodies with wide responsibilities, to advise the government on measures to be taken to develop technological education at all levels in harmony with the needs of national economy. With such central bodies may be associated sectorial committees in such areas as industrial processes, fuel and power, mineral development, food and agricultural sciences, medical sciences, transportation, and basic sciences. Wide representation of government, industry, education, labour and professional organizations will be necessary to give these bodies effective authority in their rôle.

9. There is often an urgent need to improve physical facilities, to strengthen teaching staff, and to improve the quality of the education and training in these institutions, so that their graduates receive a well-grounded education and are trained in such a manner that they are readily accepted by industry and can contribute effectively to it. This implies that the graduates from such schools have not only technical skills but also an adequate scientific background and are competent in written and oral communication. Since it is essential that graduates with technical qualifications should also be in a position to start their own enterprises, training in the elements of management science should be a required component of their foundational training. Besides, links should be developed with the local industrial concerns, and this should be reflected in the curriculum. The training should also include experimental and project work. In some instances, facilities and staff may be shared with industry and opportunities may be given for students to work in industry during vacation. In technical institutions located in areas that are virtually "industrial deserts", production units and pilot plants may be established both for training and production.

10. Related to the above is the question of the introduction of science and technology into all types of secondary or even primary schools. This is no longer a question of concession to modern trends or of giving a technical bias to education, because an education which today does not provide a good background of scientific and technological knowledge and skills, is sadly unbalanced and defective. Only a bold and imaginative overhaul of the curricula in general education can make a significant change in the desired direction. It is desirable that even in primary schools, work with simple tools and mechanical devices should be introduced. Technology relevant to local conditions as a subject in schools will provide an orientation towards a variety of occupations, connect the school to the world around it, and lead the students to lives of greater interest and satisfaction. Another important need is the provision in school of career information, guidance and counselling. Equipment need not be costly if it is truly related to everyday life in the locality, and improvisation and enthusiasm on the part of pupils and teachers can achieve much. There is a particular need for the development of such approaches in rural areas, and for the development of guides and sources for teaching of technology at these first and second levels.

11. In some instances, pre-vocational training, as a programme attached to existing educational institutions or through social welfare programmes, may be needed for those deprived of full primary education and who are unemployed. This can take the form of flexible courses related to local needs, and will require particular forms of co-operation and goodwill between the ministries involved and with local industries.

12. In highly industrialized countries, the most important part of training is done in industry, for all levels of employment including apprentices, skilled workers, technicians, engineers, research workers and managers. This increasingly takes the form of planned programmes, aimed at developing the abilities of personnel according to the changing needs of the enterprise. In many instances, there are partnership relations with local educational institutions, which provide some of the formal instruction or specialized laboratory facilities.

In developing countries, this important range of opportunities for training in industry is not available on an adequate scale, especially where industrial undertakings are small-scale enterprises run as family concerns. It is, however, essential that whatever opportunities are available should be systematically mobilized for training. Technical institutions could also have production units attached to them where the trainees would not only have an opportunity to acquire first-hand experience of operating a production unit but would be gainfully employed during their training tenure.

13. The co-operation of education and training aspects is important, as a distinct gap can too easily arise and the apprentice or technician may find that he is being asked to climb two separate ladders at the same time. Properly devised day-release or sandwich courses will often provide an adequate solution. Courses and evaluation methods should be framed in the light of the requirements of local industries or services, for transplanted overseas types can rarely be effective. As well as improving job performance, systematic training of industrial staff will improve staff morale and personnel retention, particularly in the higher technician and junior engineer categories. Furthermore, government

emphasis on training as a national responsibility, coupled with incentives, may stimulate modernization and increase industrial participation and productivity in many sectors of the economy. Balanced against this is the cost of industrial training, which may be very high. It must, however, be seen as a long-term investment, small in comparison with the ultimate cost of not doing any training at all.

14. The efficiency and also the appeal of training will be increased if modern methods are used wherever possible, particularly audio-visual aids and means that will both relate the training to the existing industrial environment and open up new concepts to the trainee. Pre-vocational programmes should have an industrial approach, rather than re-create a schoolroom atmosphere. The most essential point to make is that industrial training is vital for effective production, but to be viable it must be increasingly supported by education in the basic sciences which enable the trainee to adapt readily to new technological innovations while his competence continues to grow through further education and training.

15. In most countries there is an urgent need to develop further facilities for continuing education in the technical areas. These can take many forms, from radio and television programmes aimed at virtually illiterate urban or agricultural workers to short intensive courses in advanced topics for practising engineers or research workers.

16. The nature of the facilities will vary from country to country and in many cases no fixed structure has yet developed, nor is the problem being faced on a planned integrated basis. Sometimes the universities are satisfied to provide only post-graduate degree courses, with the knowledge that these meet a very limited need and that the more general demand is for courses which are short in duration and intensive in nature. Correspondence courses, television courses, sandwich-type courses, self-study, in-service training courses using staff from institutions or industry, evening courses, day or block release courses, and staff exchanges between institutions and industry are all possible methods of continuing education. Whilst continuing education in technological fields is of growing importance, it is significant that many practising engineers also seek to learn in areas such as management, economics, advanced mathematics, documentation techniques, and foreign languages.

17. One of the key problems in the region is the lack of qualified teachers for technical and vocational education. Expansion and improvement can only take place with a sufficient supply of qualified teachers. For the theoretical technical subjects, teachers are usually recruited from young engineering graduates who have failed to find a suitable position in industry and who hence have no experience in either industry or teaching. For practical subjects, the candidates lack the necessary experience in crafts and usually have a low level of general education.

18. The solution seems to lie in establishing a technical teacher education system which provides both education in subject matter (what to teach) and professional education (how to teach).

In technical and vocational education, the following categories of teachers may be required:

(a) technology teachers who are called upon to teach general technical subjects (e.g. strength of materials etc.,) and specialized technical subjects to students at the upper secondary or post-secondary level, both in classrooms and laboratories;

(b) vocational teachers who teach theoretical courses and/or practical courses in vocational education institutions such as vocational schools and trade schools, aiming at the training of skilled craftsmen;

(c) workshop teachers (instructors) to teach practical skills in school workshops at all technical and vocational institutions;

(d) technical orientation teachers who teach elementary technology, technical drawing and practical skills to pupils, usually in the first cycle of general education.

19. In the preparation of technical teachers as in the whole programme of technical education, a background of industrial experience is essential. Generally the teaching staff in technical institutions are lacking in this essential experience, and a variety of means will have to be used to fill the gap - inplant training with industrial enterprises for prospective teachers, training abroad specifically to provide industrial experience, and establishment of production units in teacher-training establishments.

20. The organization of technical teacher training should be on a national scale and should be closely integrated with technical/vocational education. Teacher-training programmes should, in fact, provide feedback for the development of technical and vocational curricula and of new methods and techniques. It is also important that in-service training and pre-service training should have a certain integration. Teachers have to be convinced, right from the beginning of their preparation time, that a constant up-dating is of primary importance both in the field of speciality and in teaching.

Administrators and inspectors are essential partners in technical teacher education. There is a need for close collaboration between inspection and further training of technical teachers. It should be noted that a number of developing countries have no adequate inspection service in technical and vocational education and there is inevitably a certain reluctance on the part of school staff to accept inspection.

21. The development and production of low-cost teaching materials should be integrated into the technical teacher-training programme. At the level of qualified workers and lower technicians, the translation of technical textbooks of foreign origin into indigenous languages is not always successful. Here, learning aids based mainly on visual materials seem to be more effective than verbal texts. As basic technical notions and processes are known to all countries and are internationally valid, textbooks based mainly

on graphic representation or pictures could be produced on a regional or international basis, thus helping developing countries in some measure to solve their problems of supplying technical manuals.

22. The rapid advance of science and its technological application have demonstrated the importance of high-level engineering education and research. At the same time, it has pointed up the fact that the engineering profession and its systems of education do not always show the capacity to adapt to an evolving situation. The revision of the content of engineering education must become a dynamic continuing process of design and reform, and must be carried out on a systematic and scientific basis, with the objectives defined in terms of the qualities now envisaged as being required from future graduates. The links with secondary education should be taken into account, as should relationships with allied disciplines.

23. In the area of post-graduate education and research, there are too many examples of wastage of effort and under-utilization of resources. Continuing consultation between the institutions and industry can often improve the quality and relevance of post-graduate research programmes. More consideration should be given to the possibility of sandwich-type post-graduate programmes, with due credit being given to the research and development work carried out in industry. There is a particular need for post-graduate programmes that stress the application of modern methods and technology to the regeneration and modernization of rural areas in developing countries and the creation of gainful employment.

24. The factors involved in the staffing of institutions of engineering education are important, both in developed and in developing nations. It is not only a question of attracting competent full-time staff, but also involves maintaining their pedagogical and professional competence during rapid technological change, exchanging full-time and part-time staff with industry and with other institutions, and providing both satisfactory conditions of service and a stimulating working environment. Employment in industry, where engineering activity is mostly concentrated, is always present as an alteralternative.

25. There is often a need to lay more stress on research by staff members and students concerning problems related to local economic development, so that strong links with industry may be developed. A further extension of such research and development activities may be seen in the contribution that engineers can make to multidisciplinary research centres, designed to be centres of innovation and excellence, especially in developing countries where shortages of high-level scientific talents are such that that the creation of separate research organizations may be impracticable. Together with mathematicians, physicists, chemists, biologists, earth scientists, social scientists and other such personnel, engineers of all disciplines can help to create an intellectual climate where research relevant to national economic and social development can be achieved.

IV. APPENDICES

Appendix A

PROJECTIONS OF EDUCATIONAL GROWTH IN ASIA

(1971-1980)

The Conference of Ministers of Education and Ministers Responsible for Economic Planning of Member States in Asia, held at Bangkok in November 1965, considered and examined projections up to 1980 of educational development in Asia. These projections and the methodology used in preparing them will be found in the publication, "An Asian Model of Educational Development: Perspectives for 1965-1980". (Unesco, 1966).

The Conference also recommended that the projections of the Asian Model "be revised from time to time to take account of changing conditions".

The main function envisaged in the Asian Model for the projections made herein was to present " within the assumptions made an internally consistent picture based on certain aims and objectives, and the desirable targets for future levels of educational development if these objectives of overall development are to be achieved".

This chapter reviews briefly the actual progress of education with reference to the projections of the Asian Model and presents revised projections up to 1980. These revised projections were considered by the Conference of Ministers of Education and Those Responsible for Economic Planning in Asia when it met at Singapore in May/June 1971 and served as a basis for delineating the quantitative targets for the decade, 1971-1980.

As in the case of the Asian Model, these projections refer to the developing countries of the region which are participating in the Karachi Plan.(1)

Comparison of Asian Model projections and actual progress

1. The Asian Model adopted a hypothetical school structure as a device for providing a common and comparable basis for the presentation and interpretation of future educational needs in the region. The hypothetical school structure comprised first-level education of seven grades, second-level education of five years marked out vertically in two stages, grades VIII-X and grades XI-XII; and third-level education.

2. The review presented in Chapter 2 treats the data according to the structure as they are actually found in the national education systems. In order to make these data comparable with the projections in the Asian Model, they have to be converted in terms of the hypothetical structure of the Asian Model. The following paragraphs comparing the actual progress of education with the projections of the Asian Model therefore present the data in converted form. The comparison covers a period of four years, 1964-1968, (out of 16 years covered by the Asian Model), and relates to the following parameters: enrolment increase, enrolment ratio, educational pyramid, distribution of enrolments by grade (first level), and distribution of enrolment by type of education (second and third levels).

Enrolment increase

3. Enrolment at all levels, in 1968, for the three Groups of countries(2) and the region as a whole is shown in Table 1.(3)

It will be seen that total enrolment as well as enrolments by levels is following the projections rather closely in all the Groups. Levels of education where actual enrolment is lower than the targets include the first level in Group B and second level upper stage in Group C (they are also reflected in the corresponding percentages of the region). In all other cases actual enrolment is the same or higher than the targets.

Enrolment ratio

4. Total enrolment figures represent only a result of educational policy targets which have been expressed in enrolment ratios. By measuring enrolment against the corresponding age-group of

(1) See Preface

(2) Grouping of countries is the same as in the Asian Model.

(3) All Tables referred to in the text will be found in Appendix B.

population, enrolment ratios make it possible to identify the extent to which development of education is meeting the needs of the population eligible for entry into the education system. Enrolment ratios, for the first, second and third level of education, are shown in Table 2.

5. An analysis of enrolment ratios confirms the conclusion that the development of education in Asia between 1964 and 1968 is fairly close to the targets. In Group A, although the actual enrolment at all levels is higher compared to projections, the actual enrolment ratios for the first and second levels are slightly below the targets, due to the fact that the new population estimates for all the relevant age-groups are considerably higher.

Educational pyramid

6. The "educational pyramid", i. e. the distribution of enrolment by level of education, is shown in Table 3.

In the region as a whole and in Groups B and C, the share of enrolment at the second level of education increased at a rate higher than projected.

Distribution of enrolments by grade: first-level education

7. The *Asian Model* envisaged progressive improvement in the distribution pattern of enrolment by grades at the first level of education. One of the key points was the enrolment in grades VI-VII as a proportion of the total enrolment in grades I-VII. Table 4 shows substantial improvement in all Groups of countries.

Distribution of enrolments by type of education: second and third levels

8. The Asian Model called for a diversification of education at the second level by a considerable expansion of vocational and technical education and, at the third level, for a more rapid increase of science, science-based, technological and technical courses as against arts, humanities and social sciences. The distribution of enrolment, at the second and third levels of education, by type of studies, is shown in Table 5.

9. It can be seen that, at the lower stage of the second level of education (grades VIII-X), vocational education is not only far below the targets, but its share in total enrolment at this stage, in 1968, is much lower even than in 1964. Enrolment in vocational education, grades VIII-X, increased somewhat during the period in Groups A and C, but the increase was considerably lower compared to projections and also compared to the growth of general education. On the other hand, in Group B there was a decline in the enrolment in vocational education.(1) As a result, in the region as a whole, for 1968, enrolment in vocational education, grades VIII-X was less than in 1964, whereas the projections called for an increase of nearly 70 per cent.

10. At the upper stage of the second level grades XI-XII), technical education in Group A followed the targets. In Group C the proportion of pupils in technical education in 1968 was higher compared to projections. The more rapid increase of technical education at the upper stage did not fully counterbalance the effect of a too slow increase of vocational education at the lower stage. In Group B, the proportion as well as the absolute number of pupils in technical education declined.

11. The *Asian Model* assumed that a gradually increasing proportion of teachers will be trained in teacher-training institutions at the third level, with a corresponding decline in the proportion trained at the second level. Actually, in all the Groups, this decline was more rapid compared to projections. This reflects in Groups B and C a shift towards higher qualifications of teachers, i. e. more teachers are being trained at the third level, but also, especially in Group A, the fact that some teachers are still being trained at the level lower than 10 + 2, i. e. at the lower stage of the second level of education.

PROJECTIONS OF EDUCATIONAL GROWTH: 1970-1980

12. The comparison of the actual growth of education with the targets envisaged in the *Asian Model* reveals close correspondence between actual achievement and the overall target goals, although, as explained in the following paragraphs, there is divergence in certain sectorial targets. Given this trend it would appear that the overall targets originally

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(1) This is partially due to the fact that, in 1964 figures, enrolment in grade VIII of the so-called senior basic schools in India (about 700,000 pupils) was included under vocational education since, at that time, these schools were considered as different from general schools by being vocational-oriented and were classified as a separate category in Indian educational statistics. It will be recalled that, in the *Asian Model*, vocational education at the lower stage, second level, is described as covering "a large variety of courses, either essentially vocational and preparing directly for agricultural, industrial or commercial occupations, or diversified so that they include both general education and an introduction to practical subjects". Experience shows, however, that the basic schools do not differ from general schools so substantially as to justify their enrolment being included in that of vocational education. They are therefore classified here under general education in 1968.

set for 1980 by the Bangkok Conference might not call for revision, except to the extent that it might be necessitated by a change in the educational policy of a Member State.

13. The rate of population growth has a major effect on enrolment projections. New population estimates that have now become available show some changes over the population estimates on which the projections of the Asian Model were based. Table 6 gives the new population estimates by school age-groups. The new estimates are consistently higher for all the relevant age-groups in Group A and lower in Group C (except population 13-17 years of age in 1970 and 1975). In Group B, while the population age-group 6-12 is lower in 1970, it is higher in 1975 and 1980. Similarly the age-group 13-17 is somewhat higher in 1970 and 1980 but lower in 1975, and the age-group 18-31 higher in 1970 but lower in 1975 and 1980.

14. Where the age-group population is higher than was originally estimated it will require provision of a larger number of school places to reach the target enrolment ratios. The alternatives would therefore be to maintain the target enrolment ratios for 1980 and increase the number of pupils to be enrolled, or to maintain the number of pupils to be enrolled as originally estimated and reduce the target enrolment ratios.

15. The actual progress in the period 1964-1968 shows a major divergence between achievement and the Asian Model projections in the distribution of pupils at the second-level education by type of study: the enrolment in vocational and technical education has lagged considerably behind the projected rate of growth. Since the redistribution of pupils by type of study at the second level of education assumes a fundamental and desirable structural re-orientation of the education systems, the Asian Model projections have been maintained in this regard. It is recognized that efforts would need to be intensified to bring about the redistribution originally envisaged.(1) The maintenance of the target for 1980 will, however, involve a rearrangement of the targets for the intermediate years to provide for a rapid but none the less feasible rate of progression.

16. Table 7 presents the revised target enrolment at all levels, 1970 (base year), 1975 and 1980. In order to permit comparison between the Asian Model projections and these new projections, the same hypothetical school structure has been used. For the same reason, no changes have been introduced in the grouping of countries, although some countries have developed their education more quickly than others and their position in the grouping would be somewhat different now to what it was in 1964. The implications of the new projections for the different Groups of countries are briefly summarized in the paragraphs that follow.

Projections for countries in Group A

17. The new population estimates shown for this group of countries are higher than the previous estimates for all the relevant age groups.

The 1980 projections comprise the following targets and assumptions:

(a) At the first level, enrolment in grades I-V will have to grow at an average annual rate of 9.0 per cent in order to achieve an enrolment ratio of around 53 per cent in 1980.

(b) Enrolments in grades I-VII will have to increase at an annual average rate of 9.1 per cent in order to achieve an enrolment ratio of about 45 per cent. The rate of drop-outs will need to be considerably reduced and the proportion of pupils in grades VI-VII as percentages of grades I-VII will have to be increased from about 12 in 1970 to more than 13 in 1980.

(c) The above rate of growth will involve a net increase of 1.98 million pupils in the first level between 1970 and 1980.

(d) At the second level, the total enrolment will increase at an annual average rate of 13.0 per cent to achieve an enrolment ratio of about 12 per cent in 1980. This will involve a net addition of 370,000 pupils during the decade.

(e) Vocationally-oriented education at the lower stage of secondary education (grades VIII-X) will have to increase at an annual rate of 15.5 per cent and in 1980 will account for about 19 per cent of the total enrolment at that stage. It will involve a net addition of about 58,000 pupils between 1970 and 1980.

(f) At the upper stage of second-level education (grades IX-XII), technical and vocational education will increase at an annual rate of 24.0 per cent with a net addition of 38,000 pupils. In 1980 the enrolment distribution per type of education at this stage will be: general 52 per cent, technical 34 per cent and teacher training 14 per cent.

(g) At third level, the average annual increase is estimated at 15.3 per cent in the period 1970-1980, reaching a total of 50,000 students in 1980, of whom 52 per cent will be in science and science-based studies and 48 per cent in arts and humanities. This will involve an average annual rate of growth of 17.9 per cent in science and science-based enrolment.

(h) The distribution of enrolment (percentage) by level of education ("the educational pyramid") will evolve as follows:

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(1) In the lower stage of secondary education in Group B, however, it is suggested that the target proportion of vocational education for 1980 be revised downwards, reflecting the reclassification referred to in paragraph 9. While maintaining the same rate of increase in the proportion of vocational education as envisaged in the Asian Model, this increase is now applied to a 1964 base and adjusted accordingly. Table 7 reflects this adjustment.

	1970	1980
First level	89.4	85.5
Second level	9.8	13.2
Third level	0.8	1.3

Projections for countries in Group B

18. The new population estimates for this Group of countries are higher than the earlier estimates for the age-group 6-12, which will affect the enrolment at the first level of education.

(a) It is envisaged that countries in Group B will have achieved universal enrolment in grades I-V by around 1980. This will imply an average annual growth rate of 5.6 per cent, which is somewhat higher than the countries achieved in the last decade.

(b) At first level grades I-VII, an annual average increase of 6.1 per cent will have to be achieved in order to reach an enrolment ratio of about 90 per cent in 1980. The rate of drop-outs will have to be considerably reduced and the proportion of enrolment in grades VI-VII as per cent of grades I-VII will be improved from 14.5 in 1970 to 18.4 in 1980. The above order of growth will call for a net addition of about 90.5 million pupils in the decade.

(c) At the second level of education, the projected targets will call for an average annual increase of 7.9 per cent in enrolment with a net addition of 21.6 million pupils.

(d) A considerable effort will be needed to diversify second-level education. In the lower stage of secondary education, vocational education will have to grow at an average annual rate of 19.4 per cent in order to ensure that in 1980 about 15.6 per cent of the total enrolment of that stage is in vocational-oriented type of education.

(e) At the upper stage of secondary education, the magnitude of expansion in vocational and technical education is also very high and would call for an average annual increase of 14.2 per cent. A net additional enrolment of about 2.4 million pupils will have to be achieved in vocational/technical types of education in order to ensure that in 1980 about 38.5 per cent of the total enrolment of upper secondary stage is in vocational/technical education.

(f) Teacher training is expected to shift to the third level of education and a progressive decline of enrolment in teacher training at second level is assumed after 1975.

(g) In third level education, the total enrolment is envisaged to grow at a lower rate than occurred in the last decade. The average annual rate of increase for 1970-1980 is 5.6 per cent which will mean a net increase of 1.8 million students. A high rate of growth is called for in science and science-based studies with a net addition of 1.2 million students. If this balance between the overall enrolment growth at the third level and the growth in science-based studies is achieved, 54 per cent of the students will be in science-based studies in 1980.

(h) The "educational pyramid" is expected to evolve as follows (in per cent):

	1970	1980
First level	84.0	81.9
Second level	14.2	16.4
Third level	1.8	1.7

Projections for countries in Group C

19. The new population estimates are lower for Group C (except population 13-17 in 1970 and 1975).

(a) At first level, it is envisaged that countries in Group C will be able to achieve universal education of at least seven years' duration by 1975. To this end, the average annual rate of growth during the decade will be of the order of 2.8 per cent, implying a net increase of about 8.6 million pupils.

(b) At second level, an enrolment ratio of 45 per cent is projected for 1980, which will mean an annual average rate of increase of 6.8 per cent, with a net addition of about 4.7 million pupils.

(c) At the lower stage of second-level education, vocational education is envisaged to grow at an annual average rate of 17.7 per cent and the enrolment in vocational type of education by 1980 will account for about 24 per cent of the total enrolment in that stage.

The average annual rate of increase in vocational/technical education in the upper stage of second level of education will be 4.5 per cent and the enrolment in 1980 will account for about 39 per cent of the total enrolment in that stage. This proportion is lower than that for 1970 since it is envisaged that technical education will shift more and more to post-secondary institutions.

(d) At the third level of education, an enrolment ratio of 6.34 per cent in 1980 implies an average annual rate of increase of 3.9 per cent during the period 1970-1980, with a net addition of about 315,000 students. The main increase is seen to take place in science and science-based studies which in 1980 should account for about 56.6 per cent of the total enrolment in third level education.

(e) The "educational pyramid" will evolve as follows (in per cent):

	1970	1980
First level	82.4	76.7
Second level	15.5	21.1
Third level	2.1	2.2

Projections for the region

20. The total population of the region is estimated to increase from 1,072 million in 1970 to 1,412 million in 1980 and the school-age population (6-21) from 396 million to 531 million. The educational targets for the region are the aggregate targets of the groups of countries.

(a) The enrolment ratios in the three levels of education will change as follows (in per cent):

	Estimated 1970	Projected 1980
First level	72.00	90.01
Second level	20.23	32.69
Third level	4.02	5.05

(b) At the first level, total enrolment in grades I-V will increase from 119 million in 1970 to 196 million in 1980, or at an average annual rate of 5.1 per cent.

The total enrolment at the first level (grades I-VII) will increase from 141 million in 1970 to 242 million in 1980, or at an average annual rate of 5.6 per cent.

(c) Enrolment at the second level (grades VIII-XII) will increase from 24.3 million in 1970 to 51 million in 1980 or at an average annual rate of 7.7 per cent.

Education at the second level will be diversified and facilities for technical and vocationally-oriented education will be expanded at both stages of secondary education. Enrolment in these types of education will account for 22 per cent of the total second level enrolment.

(d) At the third level, enrolment will increase from 3.2 million in 1970 to 5.3 in 1980; an average annual rate of 5.3 per cent. Besides strengthening university institutions, non-university institutions at the third level will be developed.

Of the total enrolment at the third level, 55 per cent will be in science, science-based and technological education in 1980 as compared with 43 per cent in 1970.

(e) The "educational pyramid" will change as follows (in per cent):

	1970	1980
First level	83.7	81.1
Second level	14.4	17.1
Third level	1.9	1.8

Teacher requirements

21. The number of teachers required is determined on the basis of the increase in enrolment and the assumed changes in the pupil-teacher ratios. Again, the pupil-teacher ratios for 1980 have been maintained at the same level as envisaged in the Asian Model. Assumed changes in the pupil-teacher ratios are shown in Table 8 and the number of teachers, by level of education, is shown in Table 9.

22. In the region as a whole, the total number of teachers will increase 1.7 fold. The net addition to the teaching force over the ten years will represent 3.1 million teachers, out of which 2.1 million will be for the first level of education.

Cost of expenditure

23. The costing of the projected educational development is based on unit cost estimates, i.e. on estimates of recurring costs per pupil and of capital costs per additional pupil-place. The unit cost estimates have been limited to cover only items that are minimally essential for, and directed to, instructional work. They do not include auxiliary and welfare services such as school meals, school uniforms, transportation, teachers' housing etc., which, desirable as they are, were assumed to form more appropriately part of the overall national welfare programme in which they should be costed. Nor do they include the cost of boarding, clothing and accommodation borne by the family. Opportunity costs, representing the estimated loss of income from foregone employment opportunities or, in case of capital costs, from not devoting these resources to alternative investment projects, have not been taken into account.

24. The unit cost estimates used in the Asian Model have been revised in the light of the most recent information available. In case of recurring costs per pupil, the changes have been very slight and are mainly due to changed pupil-teacher ratios. The estimates of recurring costs per pupil have been based, as in the Asian Model, on three main factors: the average annual salary of teachers, the pupil-teacher ratio and the proportion of teacher salaries to total recurring costs. At the first level of education, provision of free textbooks has also been taken into account. Recurring costs per pupil are shown in Table 10.

25. Capital costs per pupil-place have been revised by the Asian Regional Institute for School Building Research on the basis of additional surveys conducted by the Institute since 1966. The changes affect technical schools, second level upper stage, and furniture and equipment costs at all second-level institutions. The capital costs per pupil-place are assumed to be the same for all the groups of countries, and constant over the 10-year period 1970-1980. Since changes in capital costs per pupil-place as against the Asian Model are relatively more important than in recurring cost per pupil, Table 11 shows not only the final unit cost estimate, but also all its elements.

26. The replacement rate of existing pupil-places was assumed to increase gradually so as, by 1980, to reach 2.5 per cent yearly for the first level of education, 2 per cent yearly for the second level, all types, and 1 per cent yearly for the third level of education.

27. The unit cost assumptions, applied to the enrolment projections, lead to an estimation of educational costs, as shown in Table 12. The educational costs are expressed in US dollars and therefore are to be interpreted with due regard to the limitations inherent in this procedure. They are based on the assumption of a constant price level. Movement in prices will obviously imply the need for corresponding adjustment.

28. In the region as a whole, total educational costs will increase 2.2 fold between 1970 and 1980. Somewhat more than 40 per cent of these costs will be devoted to first-level education, while the share of the second level will be slightly under 40 per cent and the share of the third level about 20 perccent.

29. As a test of the economic feasibility of the educational targets the percentage of Gross National Product to be devoted to education was calculated on the basis of four GNP growth hypotheses (Table right). Their purpose is to provide a certain frame of reference for testing the economic feasibility of the envisaged educational targets.

For the fourteen developing countries of the region for which the estimates of the rates of growth are presented by ECAFE (these countries account for more than 95 per cent of the GDP of the developing countries of the region) the weighted average annual rate is computed at 6-7 per cent per annum (6 per cent on low projections and 7 per cent on high projections). The cost of educational development in terms of 6 per cent annual growth rate of GNP will account for 4.52 per cent of GNP for education in 1980, and in terms of 7 per cent for 4.04 per cent of GNP for educational expenditure. On these hypotheses, the costs involved in the magnitude of educational development envisaged for the region as a whole are at a level which appear to be feasible, and considering the contribution of education to overall development, desirable.

Total educational costs as per cent of GNP

GNP annual growth	1970	1975	1980
Group A			
At 4%	1.60	2.41	3.54
At 5%	1.57	2.25	3.16
At 6%	1.54	2.11	2.82
At 7%	1.51	1.97	2.52
Group B			
At 4%	3.75	4.77	5.91
At 5%	3.68	4.46	5.26
At 6%	3.61	4.18	4.70
At 7%	3.54	3.91	4.20
Group C			
At 4%	4.27	4.69	5.15
At 5%	4.19	4.39	4.59
At 6%	4.11	4.11	4.10
At 7%	4.04	3.84	3.66
The Region			
At 4%	3.83	4.71	5.68
At 5%	3.76	4.41	5.07
At 6%	3.69	4.12	4.52
At 7%	3.62	3.86	4.04

Note: GNP for all the countries of the Region have been obtained for 1968 from the World Bank Atlas.

Appendix B

STATISTICAL TABLES RELATING TO APPENDIX A

I. Comparative Tables

Actual Progress and Projections (the Asian Model)

(Tables 1-5)

Note: The groups in all tables refer to the following countries:

Group A: Afghanistan, Laos, Nepal;

Group B: Burma, India, Indonesia, Iran, Khmer Republic, Mongolia, Pakistan, Republic of Viet-Nam;

Group C: Republic of China, Republic of Korea, Malaysia, Philippines, Singapore, Republic of Sri Lanka, Thailand.

Table 1

Enrolment at all levels, 1968, projected(1) and actual (in thousands)

	Projected	Actual	Actual as % of projected	Projected	Actual	Actual as % of projected
		Group A			Group B	
I level (I-VII)	1,143	1,210	105.9	100,360	96,398	96.1
II level, lower stage (VIII-X)	98	99	101.0	11,732	11,730	100.0
upper stage (XI-XII)	21	21	100.0	3,589	3,595	100.2
TOTAL (VIII-XII)	119	120	100.8	15,321	15,325	100.0
III level (XIII+)	8	10	125.0	2,040	2,081	102.0
TOTAL, all levels	1,270	1,340	105.5	117,721	113,804	96.7
		Group C			The Region	
I level (I-VII)	25,277	25,328	100.2	126,780	122,936	97.0
II level, lower stage (VIII-X)	3,332	3,556	106.7	15,162	15,385	101.5
upper stage (XI-XII)	1,082	1,041	96.2	4,692	4,657	99.3
TOTAL (VIII-XII)	4,414	4,597	104.1	19,854	20,042	100.9
III level (XIII+)	622	645	103.7	2,670	2,735	102.5
TOTAL, all levels	30,313	30,570	100.8	149,304	145,714	97.6

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(1) As in the Asian Model.

Table 2

Enrolment ratios, first, second and third level of education, 1964 and 1968 (projected and actual), in per cent

	1964	1968		1964	1968	
		Projected	Actual		Projected	Actual
		Group A			Group B	
I Level	17.67	22.69	22.65	57.24	63.62	62.51
II Level	2.00	3.91	3.66	13.81	16.67	16.47
III Level	0.30	0.42	0.48	2.79	3.44	3.45
		Group C			The Region	
I Level	88.83	91.24	92.41	60.66	66.59	65.66
II Level	24.92	27.64	28.91	15.13	17.91	17.87
III Level	5.73	6.00	6.20	3.02	3.71	3.75

Note: The relevant population groups are: for the I level - population 6-12 years of age; for the II level - population 13-17 years of age; for the III level - population 18-21 years of age. For the calculation of the actual enrolment ratios in 1968 new population estimates of the United Nations have been used, whereas the 1964 and projected ratios for 1968 were based upon population estimates and projections available in 1965. As in the Asian Model, the teacher-training continuation course (grade XIII) included in the second-level enrolment totals, figures in the calculations of third-level enrolment ratios.

Table 3

Distribution of enrolment, by level of education, 1964 and 1968 (projected and actual), in per cent

	1964	1968		1964	1968	
		Projected	Actual		Projected	Actual
		Group A			Group B	
I Level	93.1	90.0	90.3	86.8	85.3	84.7
II Level	6.3	9.4	9.0	11.7	13.0	13.5
III Level	0.6	0.6	0.7	1.5	1.7	1.8
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0
		Group C			The Region	
I Level	84.7	83.4	82.9	86.4	84.9	84.4
II Level	13.4	14.6	15.0	12.0	13.3	13.7
III Level	1.9	2.0	2.1	1.6	1.8	1.9
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0

Table 4

Enrolment in Grades VI-VII as per cent of enrolment at the first level 1964 and 1968 (projected and actual), in per cent

	1964	1968		1964	1968	
		Projected	Actual		Projected	Actual
	Group A			Group B		
Grades VI-VII as per cent of grades I-VII	9.6	11.3	11.4	11.8	13.2	14.2
	Group C			The Region		
Grades VI-VII as per cent of grades I-VII	15.4	15.8	16.9	12.5	13.7	14.8

Table 5

Distribution of enrolment at the second and third levels, by type of studies, 1964 and 1968 (projected and actual), in per cent

	1964	1968		1964	1968	
		Projected	Actual		Projected	Actual
	Group A			Group B		
Second level:						
Vocational VIII-X as per cent of total VIII-X	21.3	21.3	13.1	18.2	21.0	4.3
Technical XI-XII as per cent of total XI-XII	10.0	14.3	14.3	25.6	28.9	16.5
Teacher training XI-XII as per cent of total XI-XII	30.0	23.8	9.5	17.8	15.3	7.0
Third level:						
Science, science-based, technological and technical XIII+ as per cent of total XIII+	35.7	38.4	43.5	43.6	44.7	43.0
	Group C			The Region		
Second level:						
Vocational VIII-X as per cent of total VIII-X	7.2	12.2	6.4	15.8	19.1	4.8
Technical XI-XII as per cent of total XI-XII	40.8	38.9	47.1	29.8	31.1	23.3
Teacher training XI-XII as per cent of total XI-XII	8.3	6.8	5.5	13.2	13.4	6.7
Third level:						
Science, science-based, technological and technical XIII+ as per cent of total XIII+	35.5	39.8	37.5	41.5	43.7	41.7

II. Projections of Educational Growth (Revised)

1970-1980

(Tables 6-12)

Table 6

Estimated school-age population and total population
1970-1975-1980 (in thousands)

	1970	1975	1980
Group A			
6-12	5,550	6,483	7,610
13-17	3,424	3,767	4,342
18-21	2,372	2,689	2,960
Total 6-21	11,346	12,939	14,912
All ages	31,221	35,319	40,043
Group B			
6-12	161,403	191,662	225,625
13-17	99,123	109,954	129,519
18-21	67,030	78,576	87,505
Total 6-21	327,556	380,192	442,649
All ages	895,118	1,029,215	1,177,207
Group C			
6-12	28,627	31,446	35,454
13-17	17,046	19,847	21,857
18-21	11,146	13,755	15,935
Total 6-21	56,819	65,048	73,246
All ages	145,912	168,760	195,042
The Region			
6-12	195,580	229,591	268,689
13-17	119,593	133,568	155,718
18-21	80,548	95,020	106,400
Total 6-21	395,721	458,179	530,807
All ages	1,072,251	1,233,294	1,412,292

Source: Population Division, United Nations.

Table 7

Estimated enrolment at all levels,
1970 (base year), 1975 and 1980
(in thousands)

Level of education	1970	1975	1980	1970	1975	1980
		Group A			Group B	
First level (I-VII)						
Grades I-V	1,251	1,955	2,955	96,089	127,856	165,653
Enrolment ratio	30.89%	40.43%	52.93%	81.14%	89.53%	100.05%
Grades I-VII	1,420	2,233	3,399	112,385	152,428	202,882
Enrolment ratio	25.59%	34.44%	44.67%	69.63%	79.53%	89.92%
Proportion of all levels	89.4%	87.2%	85.5%	84.0%	82.8%	81.9%
Second level (VIII-XII)						
Lower stage (VIII-X)						
General	108	195	321	13,785	19,673	27,140
Vocational	18	39	76	850	2,186	5,016
Total (VIII-X)	126	234	397	14,635	21,859	32,156
Upper stage (XI-XII)						
General	21	40	67	3,238	4,381	4,954
Technical and vocational	5	16	43	863	1,756	3,271
Teacher training	3	8	18	304	392	272
Total (XI-XII)	29	64	128	4,405	6,529	8,497
Total (VIII-XII)	155	298	525	19,040	28,388	40,653
Enrolment ratio	4.53%	7.88%	12.04%	19.13%	25.74%	31.32%
Proportion of all levels	9.8%	11.6%	13.2%	14.2%	15.4%	16.4%
Third level (XIII+)						
Science and other (XIII+)	5	14	26	1,080	1,660	2,290
Arts and other (XIII+)	7	16	24	1,375	1,720	1,936
Total (XIII+)	12	30	50	2,455	3,380	4,226
Enrolment ratio	0.51%	1.15%	1.77%	3.77%	4.41%	4.92%
Proportion of all levels	0.8%	1.2%	1.3%	1.8%	1.8%	1.7%
Percentage in science and other (XIII+)	44.3%	46.6%	52.0%	44.0%	49.1%	54.2%
TOTAL (All Levels)	1,587	2,561	3,974	133,880	184,196	247,761
Index (1970 = 100)	100.0	161.4	250.4	100.0	137.6	185.1
		Group C			The Region	
First level (I-VII)						
Grades I-V	21,936	24,883	27,328	119,276	154,694	195,936
Enrolment ratio	104.87%	108.85%	104.72%	83.18%	90.73%	99.34%
Grades I-VII	26,949	31,311	35,528	140,754	185,972	241,809
Enrolment ratio	94.14%	99.57%	100.21%	72.00%	81.04%	90.01%
Proportion of all levels	82.4%	80.0%	76.7%	83.7%	82.3%	81.1%

Level of education	1970	1975	1980	1970	1975	1980
		Group C			The Region	
Second level (VIII-XII)						
Lower stage (VIII-X)						
General	3,614	4,558	5,931	17,507	24,426	33,392
Vocational	371	920	1,894	1,239	3,145	6,986
Total (VIII-X)	3,985	5,478	7,825	18,746	27,571	40,378
Upper stage (XI-XII)						
General	533	803	1,158	3,792	5,224	6,179
Technical and vocational	496	631	773	1,364	2,403	4,087
Teacher training	53	50	37	360	450	327
Total (XI-XII)	1,082	1,484	1,968	5,516	8,077	10,593
Total (VIII-XII)	5,067	6,962	9,793	24,262	35,648	50,971
Enrolment ratio	29.68%	35.13%	44.76%	20.23%	26.65%	32.69%
Proportion of all levels	15.5%	17.8%	21.1%	14.4%	15.8%	17.1%
Third level (XIII+)						
Science and other (XIII+)	275	419	566	1,360	2,093	2,882
Arts and other (XIII+)	410	429	434	1,792	2,165	2,394
Total (XIII+)	685	848	1,000	3,152	4,258	5,276
Enrolment ratio	6.21%	6.24%	6.34%	4.02%	4.58%	5.05%
Proportion of all levels	2.1%	2.2%	2.2%	1.9%	1.9%	1.8%
Percentage in science and other (XIII+)	40.2%	49.4%	56.6%	43.2%	49.2%	54.6%
TOTAL (All Levels)	32,701	39,121	46,321	168,168	225,878	298,056
Index (1970 = 100)	100.0	119.6	141.7	100.0	134.3	177.2

Note: As in the Asian Model, the teacher-training continuation course (Grade XIII), included in the second-level enrolment totals, figures in the calculations of third-level enrolment ratios.

Table 8

Pupil-teacher ratios, by level and type

	Group A			Group B			Group C		
	1970	1975	1980	1970	1975	1980	1970	1975	1980
First level	36	40	45	45	45	45	37	40	45
Second level, lower stage									
general	25	25	25	25	25	30	30	30	30
vocational	20	20	20	20	20	25	24	25	25
Second level, upper stage									
general	20	20	20	20	25	25	28	25	25
technical	20	20	20	16	18	20	20	20	20
teacher training	16	20	25	16	20	25	12	20	25
Third level, science, etc.	12	12	12	12	12	12	12	12	12
Arts, etc.	22	22	22	22	22	22	22	22	22

Table 9

Teachers, by level of education (in thousands)

	Group A			Group B		
	1970	1975	1980	1970	1975	1980
First level	39	56	76	2,497	3,388	4,508
Second level	7	13	23	829	1,189	1,478
Third level	1	2	3	153	216	279
Total, all levels	47	71	102	3,479	4,792	6,265
	Group C			The Region		
First level	728	783	790	3,264	4,277	5,374
Second level	186	255	360	1,022	1,457	1,861
Third level	42	54	67	196	272	349
Total, all levels	956	1,092	1,217	4,482	5,956	7,584

Table 10

Recurring costs per pupil, by level and type of education (in US dollars at constant prices)

	Group A		Group B		Group C	
	1970	1980	1970	1980	1970	1980
First level	9.70	11.30	8.40	12.10	21.40	22.80
Second level, lower stage						
general	26.50	34.80	39.00	40.80	41.80	50.40
vocational	38.00	50.20	56.00	56.50	60.10	69.80
Second level, upper stage						
general	33.10	43.50	48.80	49.00	44.90	60.50
technical	82.10	99.80	113.90	107.10	127.40	149.60
teacher training	74.80	57.60	87.70	67.70	146.90	85.30
Third level, Science, etc.	313.20	381.80	313.20	381.80	350.90	427.60
Arts, etc.	141.60	163.60	141.60	163.60	158.60	183.20

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Table 11

Capital costs per pupil-place, by level and type of education
(in US dollars at constant prices)

	Net building cost per sq. m.	Area per pupil-place sq. m.	Net building cost per pupil-place	Site cost	Furniture and equipment	Total
First level	27	1.3	35	4	7	46
Second level, lower stage						
general	40	3	120	36	50	206
vocational	40	4	160	48	88	296
Second level, upper stage						
general	40	3	120	36	50	206
technical	45	6	270	60	144	474
teacher training	40	3	120	36	50	206
Third level, Science, etc.	60	16	960	480	640	2,080
Arts, etc.	60	6	360	180	120	660

Table 12

Educational costs, recurring and capital, by level of education
(in thousands of US dollars at constant prices)

	1970			1975			1980		
	recurring costs	capital costs	total costs	recurring costs	capital costs	total costs	recurring costs	capital costs	total costs
				Group A					
First level	13774	6854	20628	23446	11086	34532	38409	17618	56027
Second level	4876	5380	10256	11175	9745	20920	23229	19241	42470
Third level	2557	3354	5911	7316	4526	11842	13853	8108	21961
Total, all levels	21207	15588	36795	41937	25357	67294	75491	44967	120458
				Group B					
First level	944034	376354	1320388	1539523	553219	2092742	2454872	783007	3237879
Second level	868186	410896	1279082	1421343	615700	2027043	2002201	1063855	3066056
Third level	532956	258918	791874	840454	290856	1131310	1191052	407362	1598414
Total, all levels	2345176	1056168	3391344	3801320	1459775	5251095	5648125	2254224	7902349

	1970			1975			1980		
	recurring costs	capital costs	total costs	recurring costs	capital costs	total costs	recurring costs	capital costs	total costs
				Group C					
First level	576708	50080	626788	704498	53875	758373	810038	74525	884563
Second level	268270	90177	358447	406586	143206	549792	619980	234231	854211
Third level	161524	56868	218392	236731	63300	300021	321530	88362	409892
Total, all levels	1006502	197125	1203627	1347805	260381	1608186	1751548	397118	2148666
				The Region					
First level	1534516	433288	1967804	2267467	618180	2885647	3303319	875150	4178469
Second level	1141332	506453	1647785	1839104	768651	2597755	2645410	1317327	3962737
Third level	697037	319140	1016177	1084491	358682	1443173	1526435	503832	2030267
Total, all levels	3372885	1258881	4631766	5191062	1745513	6926575	7475164	2696309	10171473

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